Junit, Eclipse 및 빌드환경

Team : T3

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컴퓨터 공학부 201111360 손준익
컴퓨터 공학부 201111384 정국빈

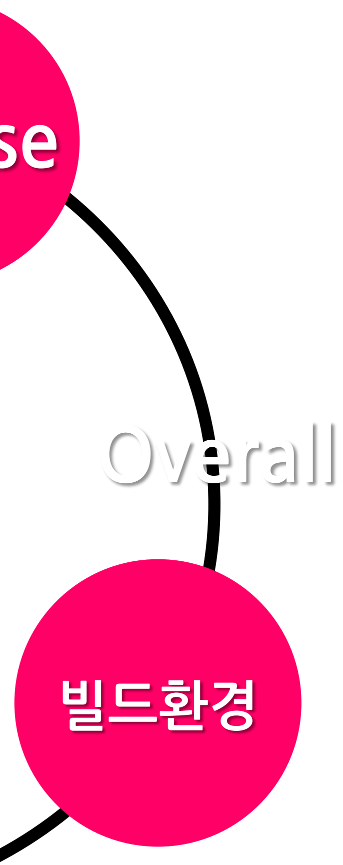
목차

Eclipse

JUnit

빌드환경

Eclipse

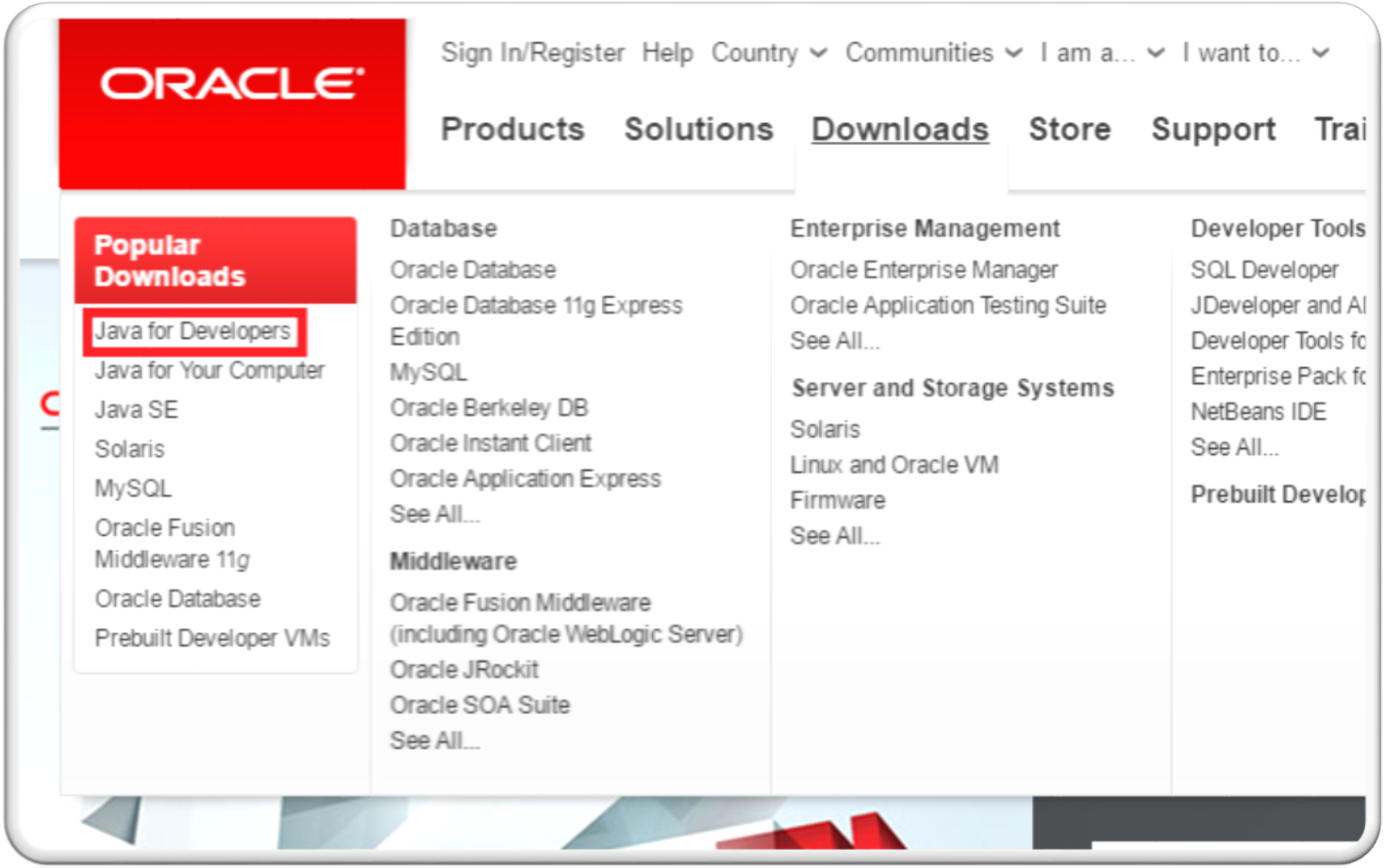


- 소개
  - JAVA를 개발하기 위한 통합 개발 환경
- 주요기능
  - Code edit / Compile / Build
  - Unit Test, Debug
- 특징
  - JAVA Code를 작성하고 이에 대한 debugging 기능을 제공
  - 사용자가 쉽고 빠르게 SW 개발을 할 수 있는 통합 개발 환경
  - Plug in 설치를 통한 다른 Tool들과 쉬운 결합

Eclipse

JDK 설치

http://www.oracle.com/index.html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Oracle Fusion Middleware 11g
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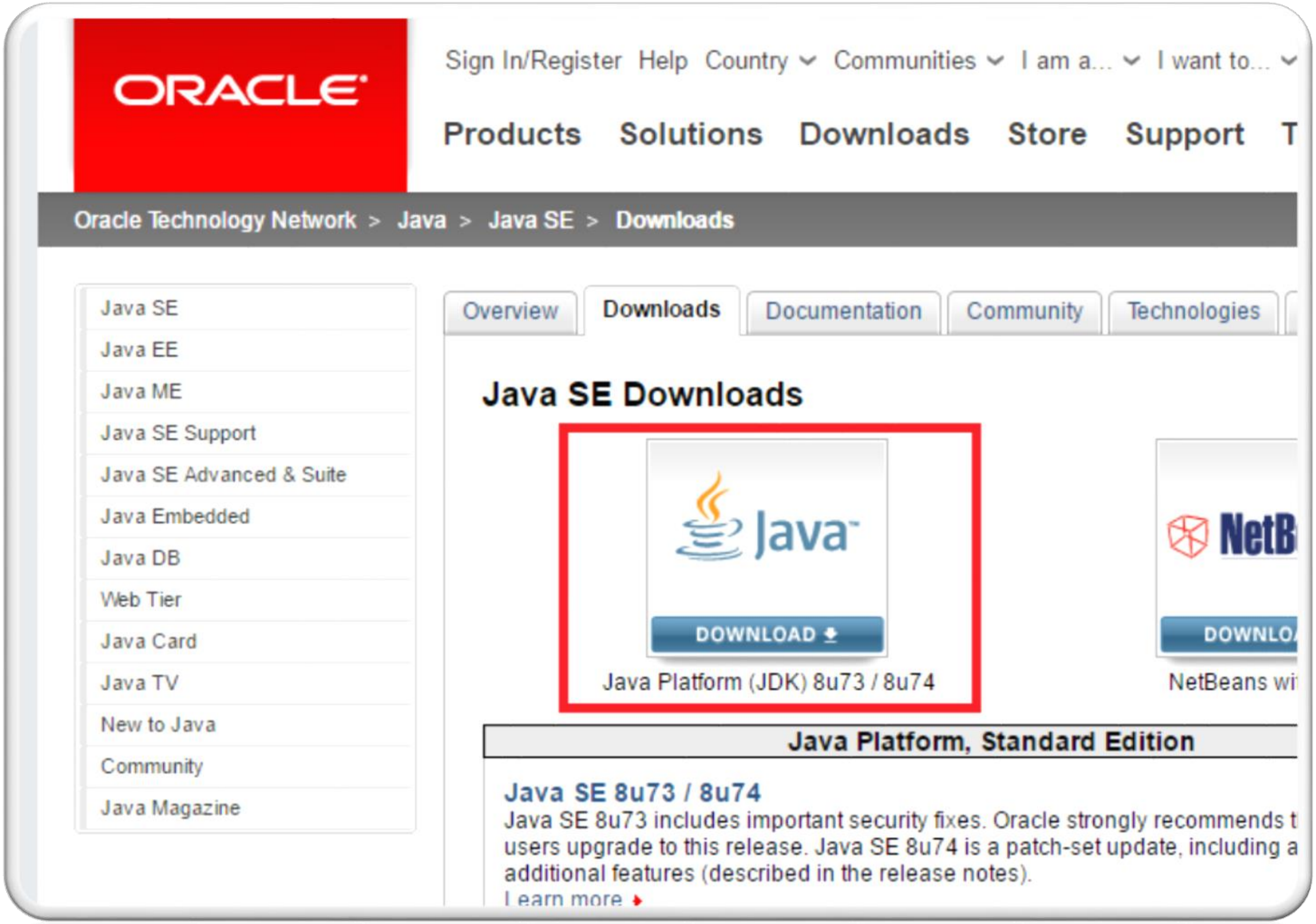
Oracle Database
Oracle Database 11g Express Edition
MySQL
Oracle Berkeley DB
Oracle Instant Client
Oracle Application Express
See All...
Middleware
Oracle Fusion Middleware (including Oracle WebLogic Server)
Oracle JRockit
Oracle SOA Suite
See All...
Enterprise Management
Oracle Enterprise Manager
Oracle Application Testing Suite
See All...
Server and Storage Systems
Solaris
Linux and Oracle VM
Firmware
See All...
Developer Tools
SQL Developer
JDeveloper and AI
Developer Tools fo
Enterprise Pack fo
NetBeans IDE
See All...
Prebuilt Develo

Eclipse

JDK
설치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Java Platform (JDK) 8u73 / 8u74

NetBeans wi

Java Platform, Standard Edition

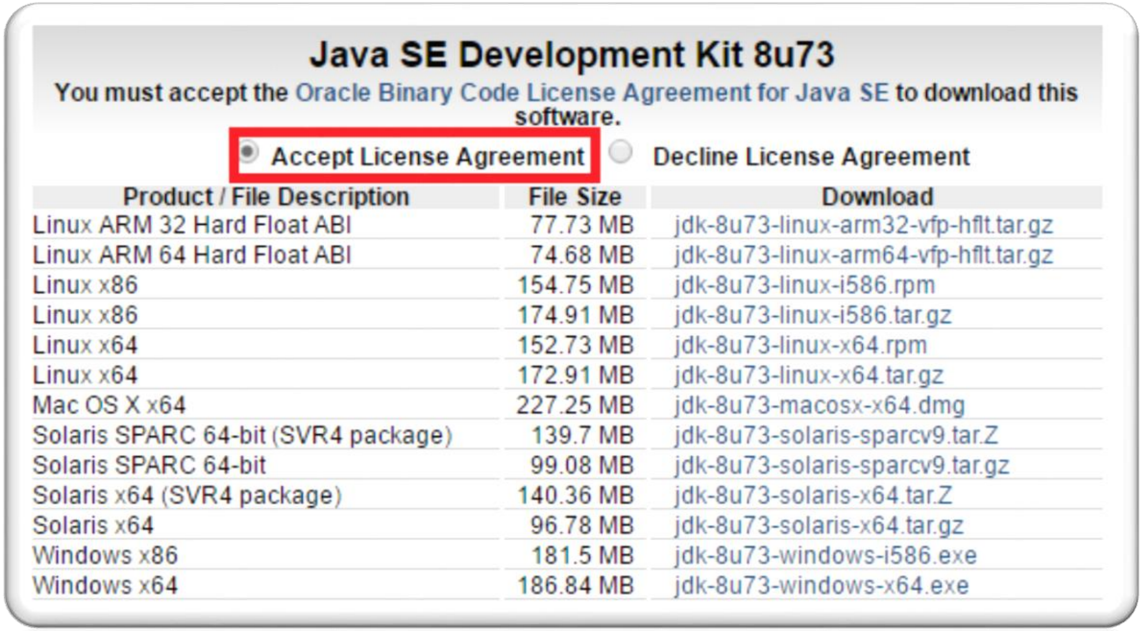
Java SE 8u73 / 8u74

Java SE 8u73 includes important security fixes. Oracle strongly recommends t users upgrade to this release. Java SE 8u74 is a patch-set update, including a additional features (described in the release notes).

Learn more

Eclipse

JDK
설치



Java SE Development Kit 8u73

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Product / File Description	File Size	Download
Linux ARM 32 Hard Float ABI	77.73 MB	jdk-8u73-linux-arm32-vfp-hflt.tar.gz
Linux ARM 64 Hard Float ABI	74.68 MB	jdk-8u73-linux-arm64-vfp-hflt.tar.gz
Linux x86	154.75 MB	jdk-8u73-linux-i586.rpm
Linux x86	174.91 MB	jdk-8u73-linux-i586.tar.gz
Linux x64	152.73 MB	jdk-8u73-linux-x64.rpm
Linux x64	172.91 MB	jdk-8u73-linux-x64.tar.gz
Mac OS X x64	227.25 MB	jdk-8u73-macosx-x64.dmg
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Solaris SPARC 64-bit	99.08 MB	jdk-8u73-solaris-sparcv9.tar.gz
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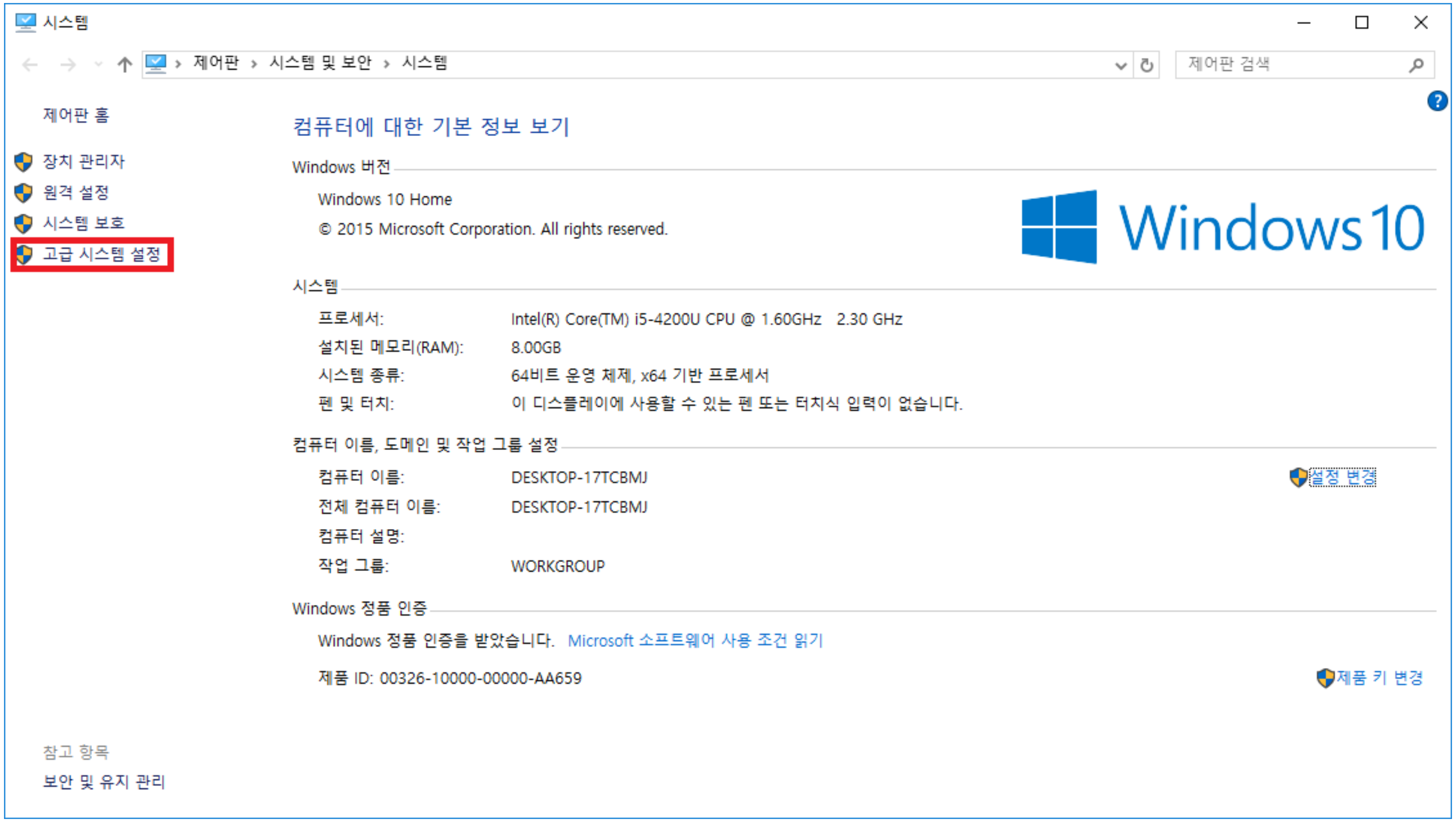
Solaris x64	96.78 MB	jdk-8u73-solaris-x64.tar.gz
Windows x86	181.5 MB	jdk-8u73-windows-i586.exe
Windows x64	186.84 MB	jdk-8u73-windows-x64.exe

개발환경에 맞는 OS 선택

Eclipse

환경변수
설정


시스템
제어판 › 시스템 및 보안 › 시스템
제어판 검색
제어판 홈
장치 관리자
원격 설정
시스템 보호
고급 시스템 설정
설정 변경
제품 키 변경
참고 항목
보안 및 유지 관리

컴퓨터에 대한 기본 정보 보기

Windows 버전

Windows 10 Home
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Windows 10

시스템

프로세서:	Intel(R) Core(TM) i5-4200U CPU @ 1.60GHz 2.30 GHz
설치된 메모리(RAM):	8.00GB
시스템 종류:	64비트 운영 체제, x64 기반 프로세서
펜 및 터치:	이 디스플레이에 사용할 수 있는 펜 또는 터치식 입력이 없습니다.

컴퓨터 이름, 도메인 및 작업 그룹 설정

컴퓨터 이름:	DESKTOP-17TCBMJ
전체 컴퓨터 이름:	DESKTOP-17TCBMJ
컴퓨터 설명:	
작업 그룹:	WORKGROUP

Windows 정품 인증

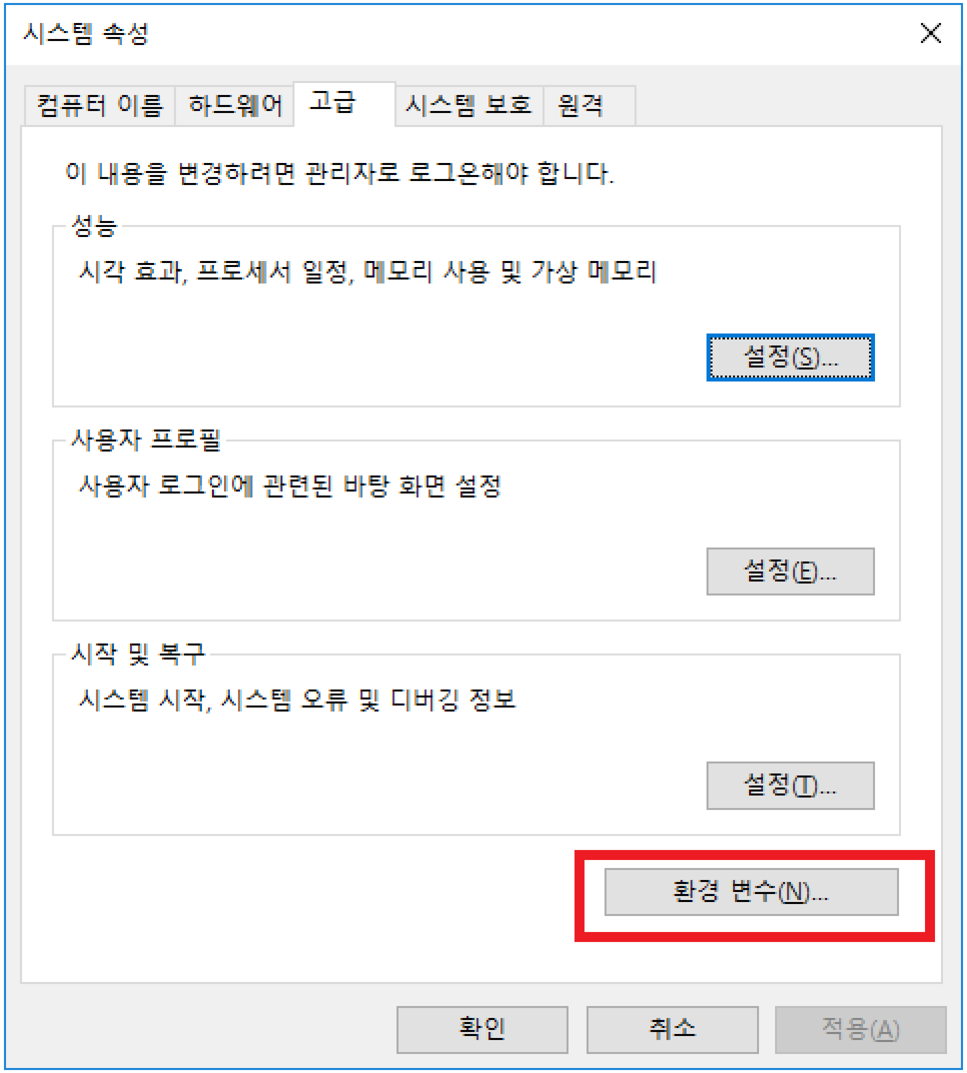
Windows 정품 인증을 받았습니다. Microsoft 소프트웨어 사용 조건 읽기

제품 ID: 00326-10000-00000-AA659

JAVA Path 설정

Eclipse

환경변수 설정



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하드웨어
고급
시스템 보호
원격

이 내용을 변경하려면 관리자로 로그온해야 합니다.

성능

시각 효과, 프로세서 일정, 메모리 사용 및 가상 메모리

설정(S)...

사용자 프로필

사용자 로그인에 관련된 바탕 화면 설정

설정(E)...

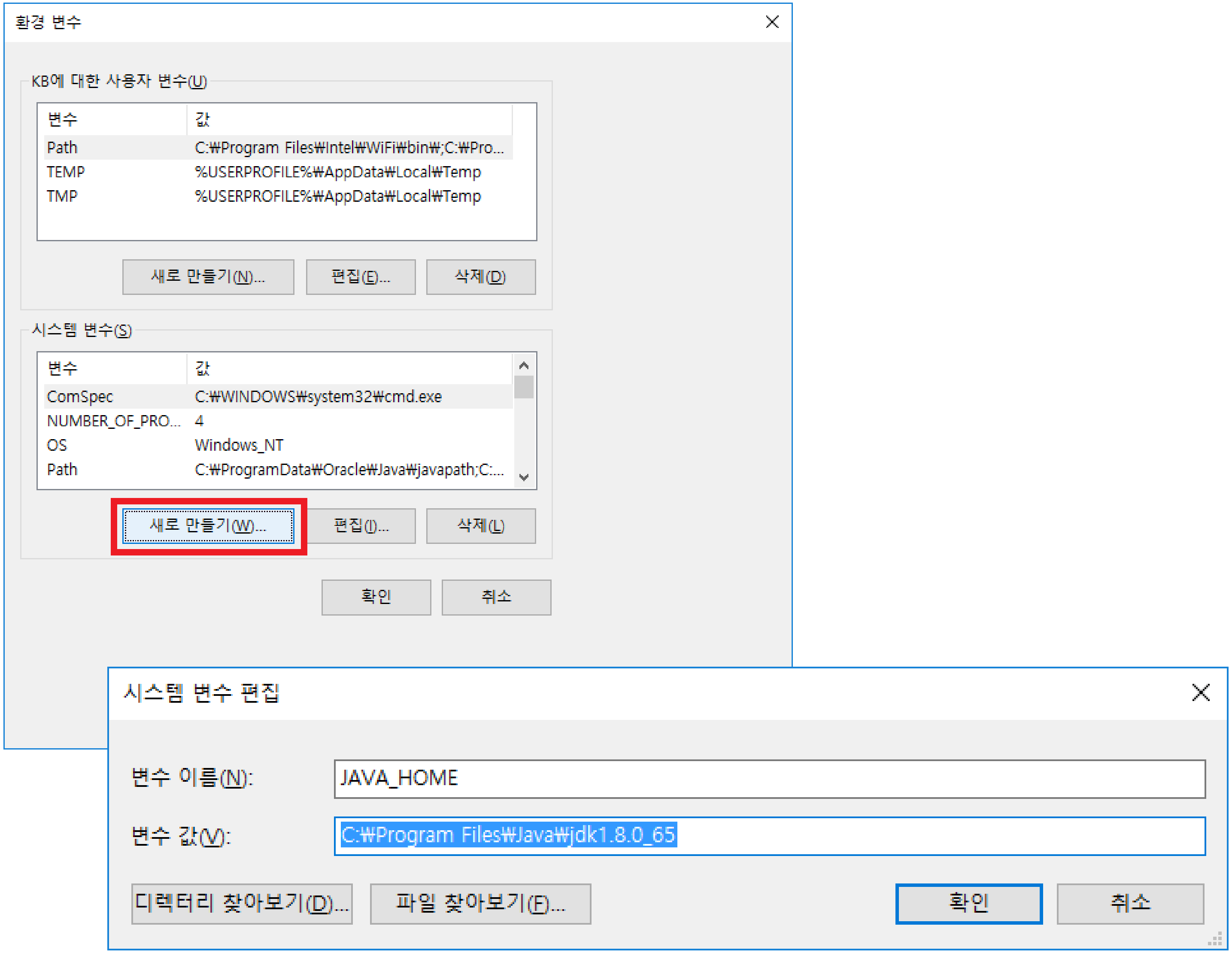
시작 및 복구

시스템 시작, 시스템 오류 및 디버깅 정보

설정(T)...
환경 변수(N)...
확인
취소
적용(A)

Eclipse

환경변수
설정


환경 변수
새로 만들기(N)...
편집(E)...
삭제(D)
새로 만들기(W)...
편집(I)...
삭제(L)
확인
취소
시스템 변수 편집
디렉터리 찾아보기(D)...
파일 찾아보기(F)...
확인
취소

KB에 대한 사용자 변수(U)

변수	값
Path	C:₩Program Files₩Intel₩WiFi₩bin₩;C:₩Pro...
TEMP	%USERPROFILE%₩AppData₩Local₩Temp
TMP	%USERPROFILE%₩AppData₩Local₩Temp

시스템 변수(S)

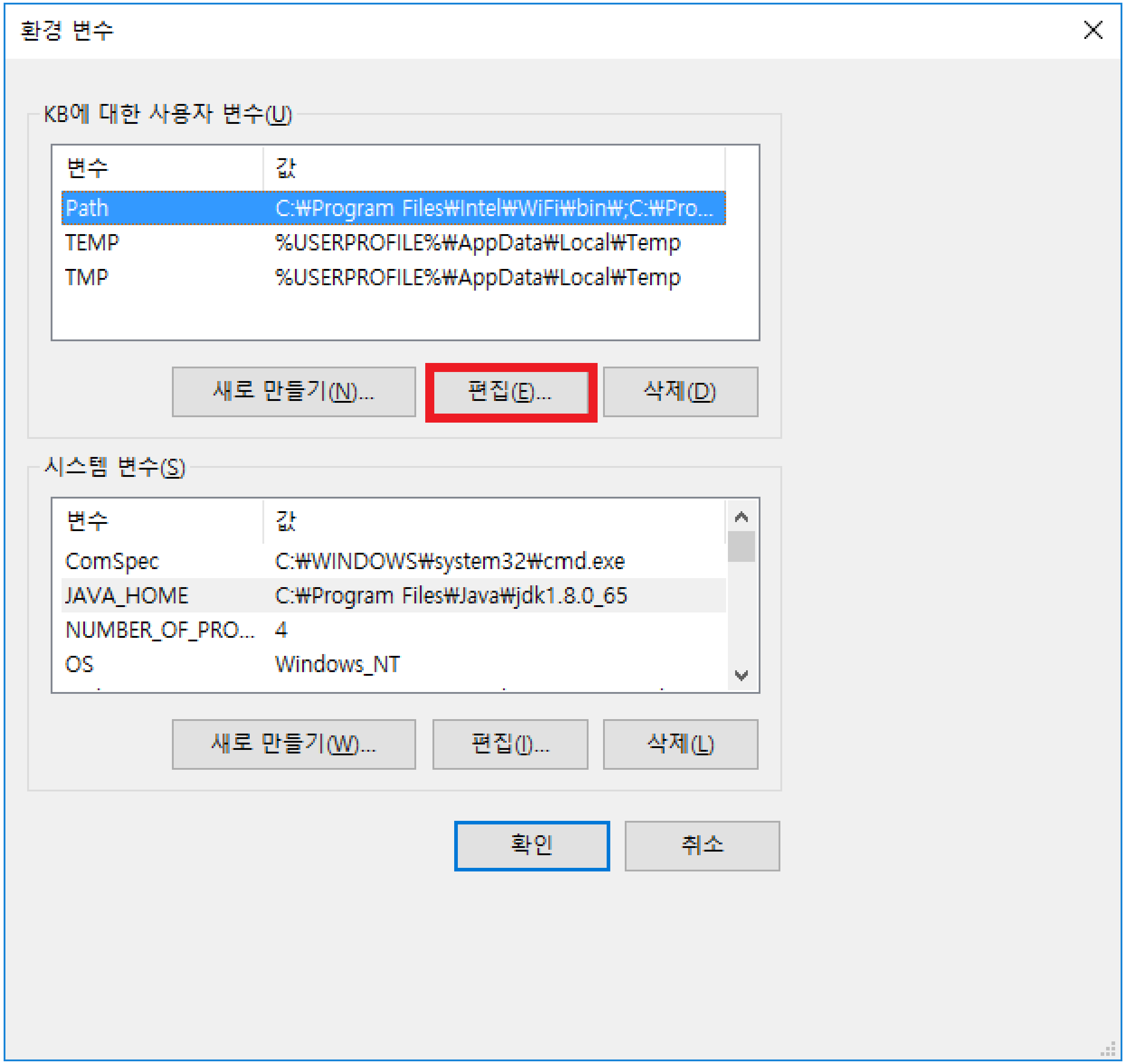
변수	값
ComSpec	C:₩WINDOWS₩system32₩cmd.exe
NUMBER_OF_PRO...	4
OS	Windows_NT
Path	C:₩ProgramData₩Oracle₩Java₩javapath;C:...

변수 이름(N): JAVA_HOME

변수 값(V): C:₩Program Files₩Java₩jdk1.8.0_65

Eclipse

환경변수 설정


환경 변수
KB에 대한 사용자 변수(U)
새로 만들기(N)...
편집(E)...
삭제(D)
시스템 변수(S)
새로 만들기(W)...
편집(I)...
삭제(L)
확인
취소

KB에 대한 사용자 변수(U)

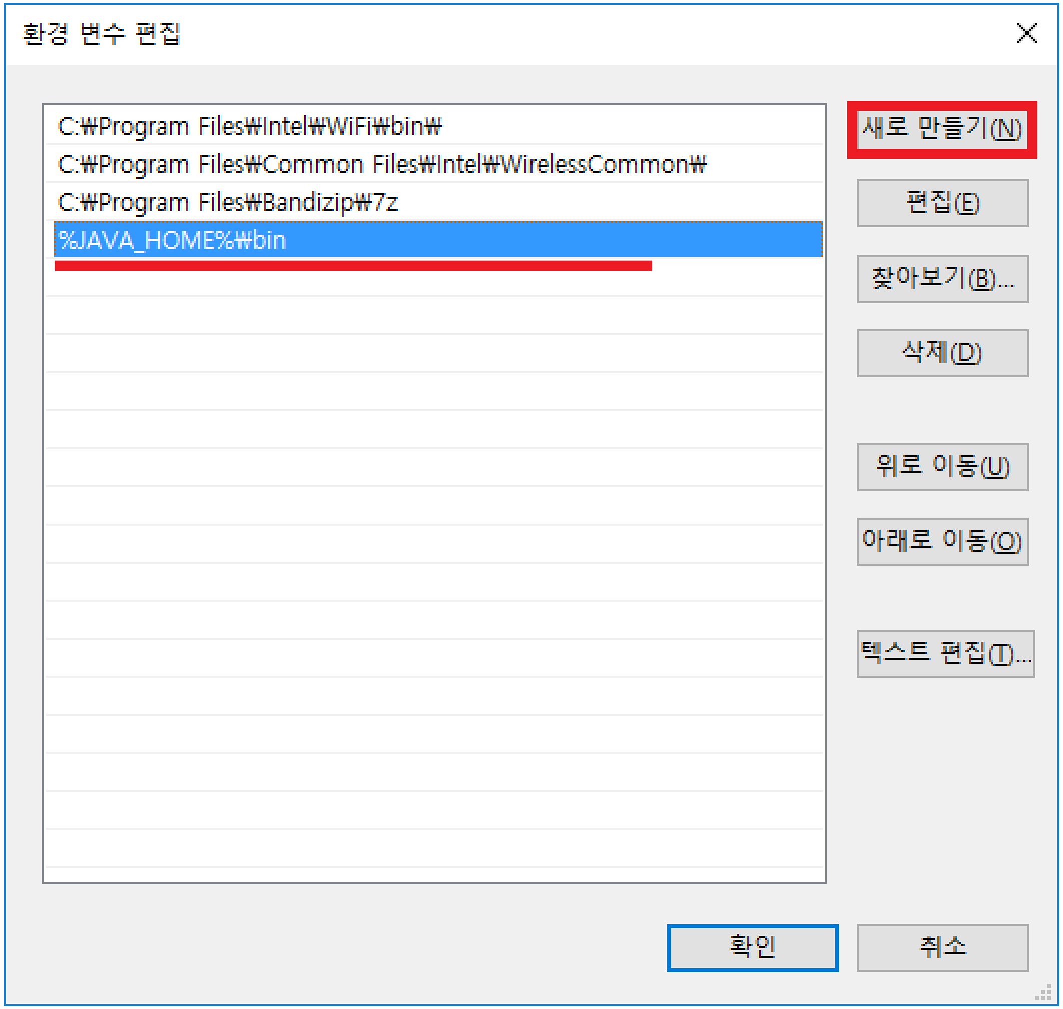
변수	값
Path	C:₩Program Files₩Intel₩WiFi₩bin₩;C:₩Pro...
TEMP	%USERPROFILE%₩AppData₩Local₩Temp
TMP	%USERPROFILE%₩AppData₩Local₩Temp

시스템 변수(S)

변수	값
ComSpec	C:₩WINDOWS₩system32₩cmd.exe
JAVA_HOME	C:₩Program Files₩Java₩jdk1.8.0_65
NUMBER_OF_PRO...	4
OS	Windows_NT

Eclipse

환경변수 설정



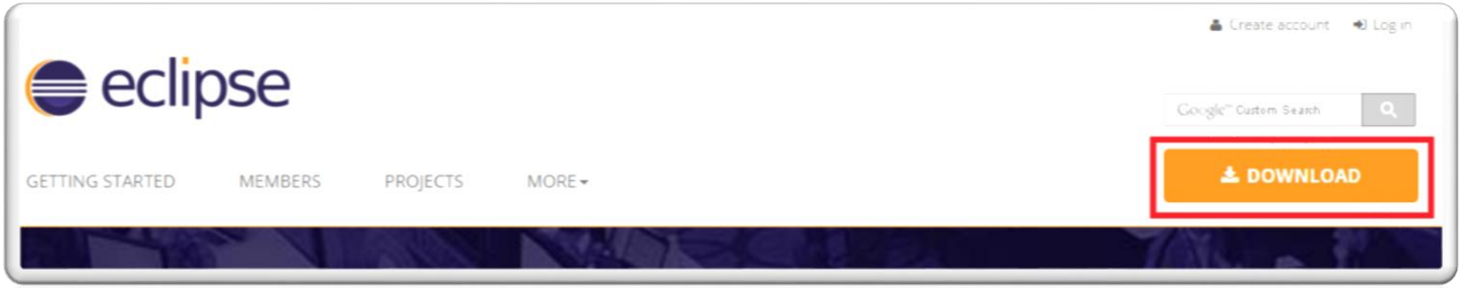
환경 변수 편집
새로 만들기(N)
편집(E)
찾아보기(B)...
삭제(D)
위로 이동(U)
아래로 이동(O)
텍스트 편집(T)...
확인
취소

C:₩Program Files₩Intel₩WiFi₩bin₩
C:₩Program Files₩Common Files₩Intel₩WirelessCommon₩
C:₩Program Files₩Bandizip₩7z
%JAVA_HOME%₩bin

Eclipse

Eclipse
설 치

http://www.eclipse.org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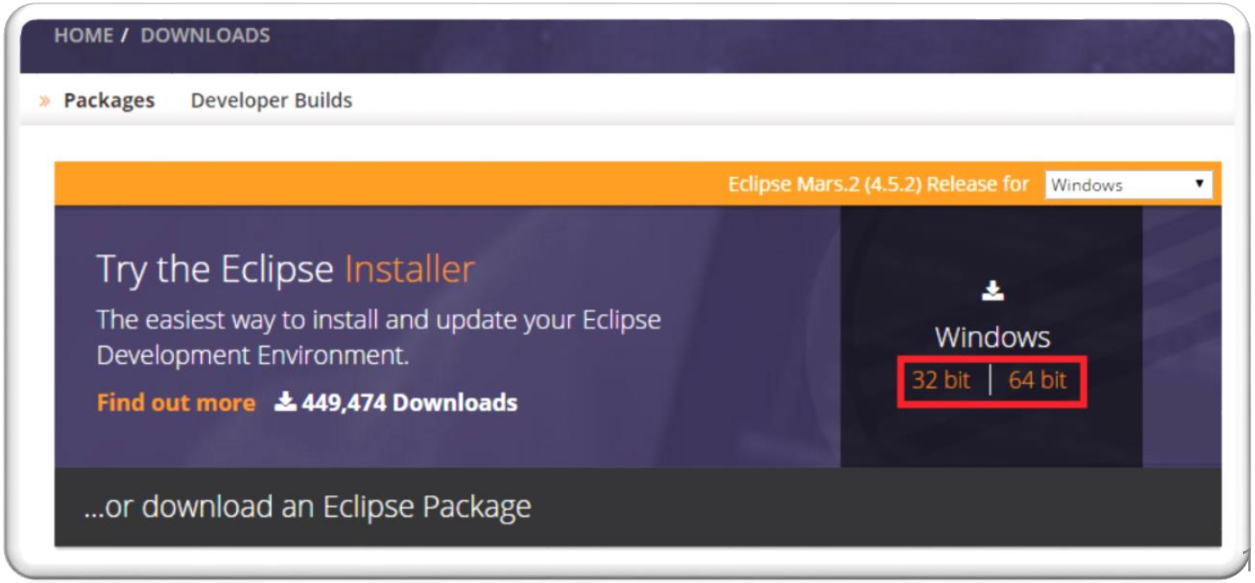
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Eclipse Mars.2 (4.5.2) Release for
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Windows
32 bit
64 bit

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Eclipse

Eclipse
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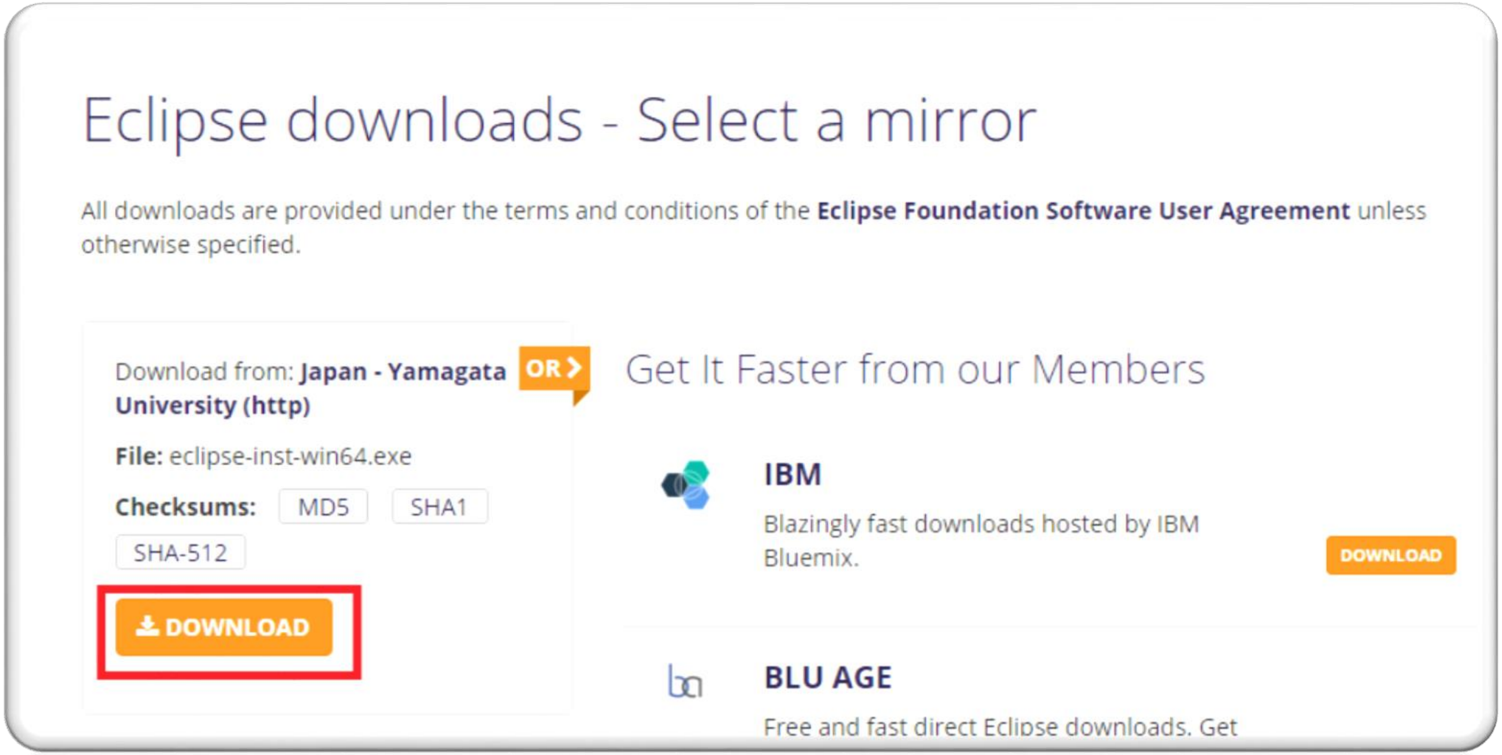

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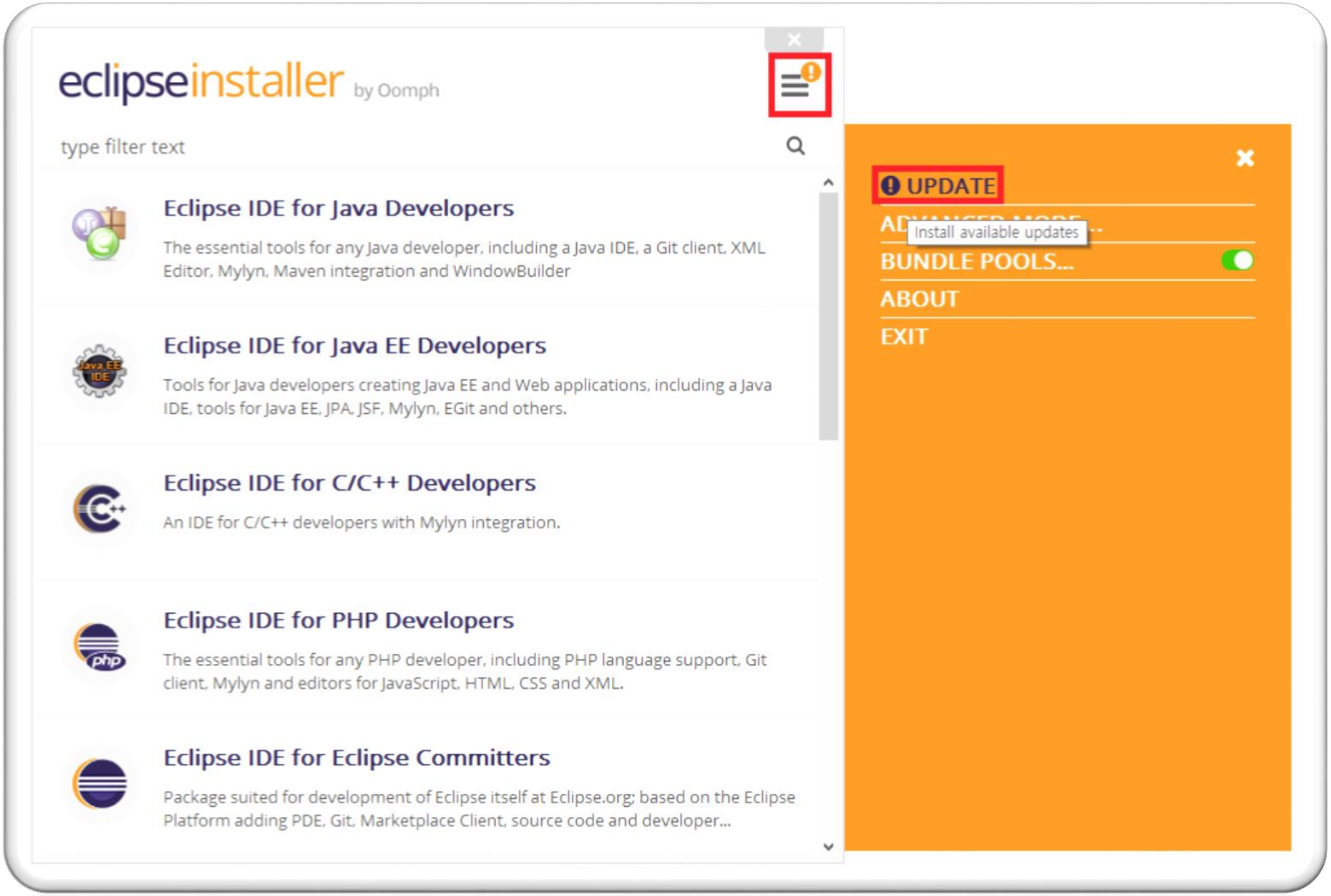
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type filter text
UPDATE
Install available updates
ADVANCED MODE...
BUNDLE POOLS...
ABOUT
EXIT

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The essential tools for any Java developer, including a Java IDE, a Git client, XML Editor, Mylyn, Maven integration and WindowBuilder

Eclipse IDE for Java EE Developers

Tools for Java developers creating Java EE and Web applications, including a Java IDE, tools for Java EE, JPA, JSF, Mylyn, EGit and others.

Eclipse IDE for C/C++ Developers

An IDE for C/C++ developers with Mylyn integration.

Eclipse IDE for PHP Developers

The essential tools for any PHP developer, including PHP language support, Git client, Mylyn and editors for JavaScript, HTML, CSS and XML.

Eclipse IDE for Eclipse Committers

Package suited for development of Eclipse itself at Eclipse.org; based on the Eclipse Platform adding PDE, Git, Marketplace Client, source code and developer...

Eclipse

Eclipse
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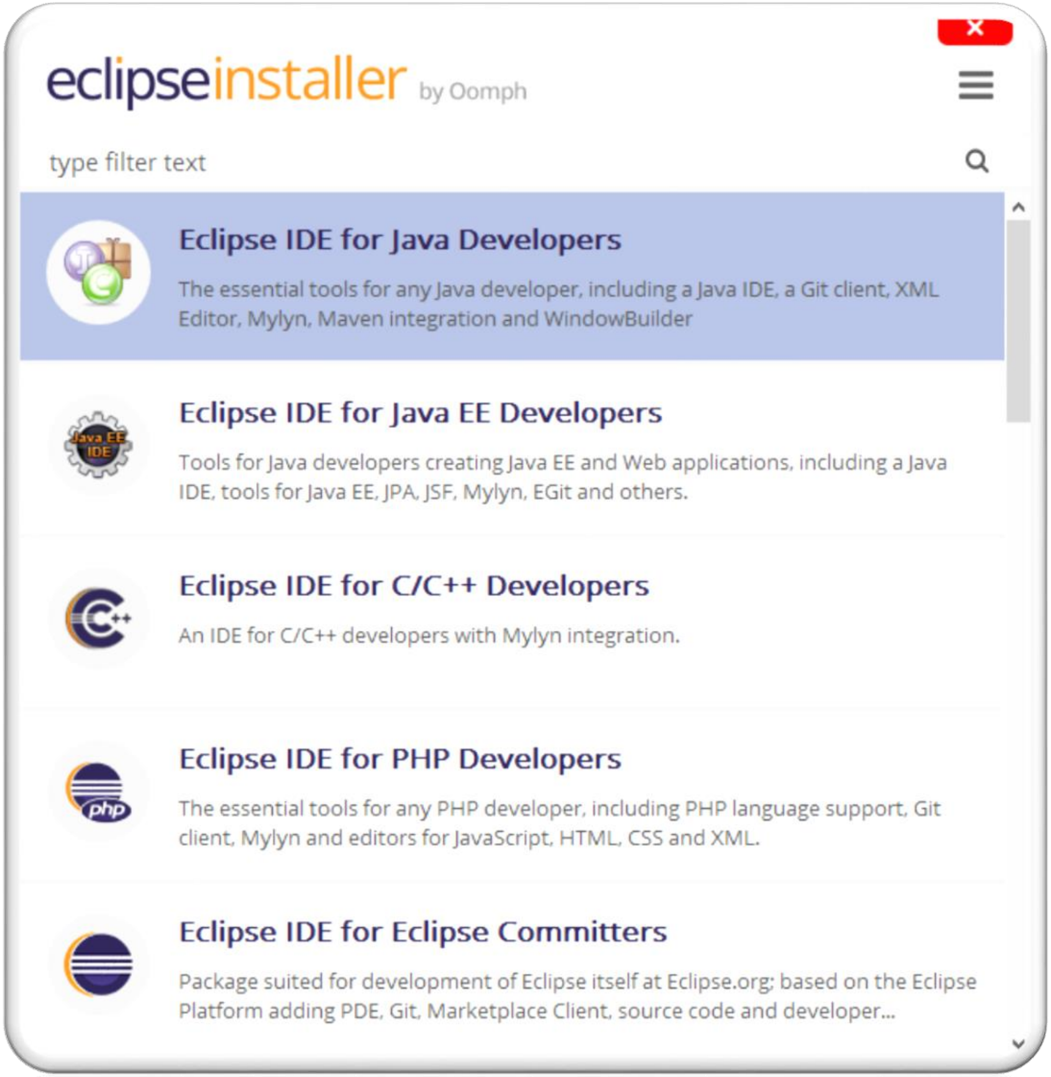

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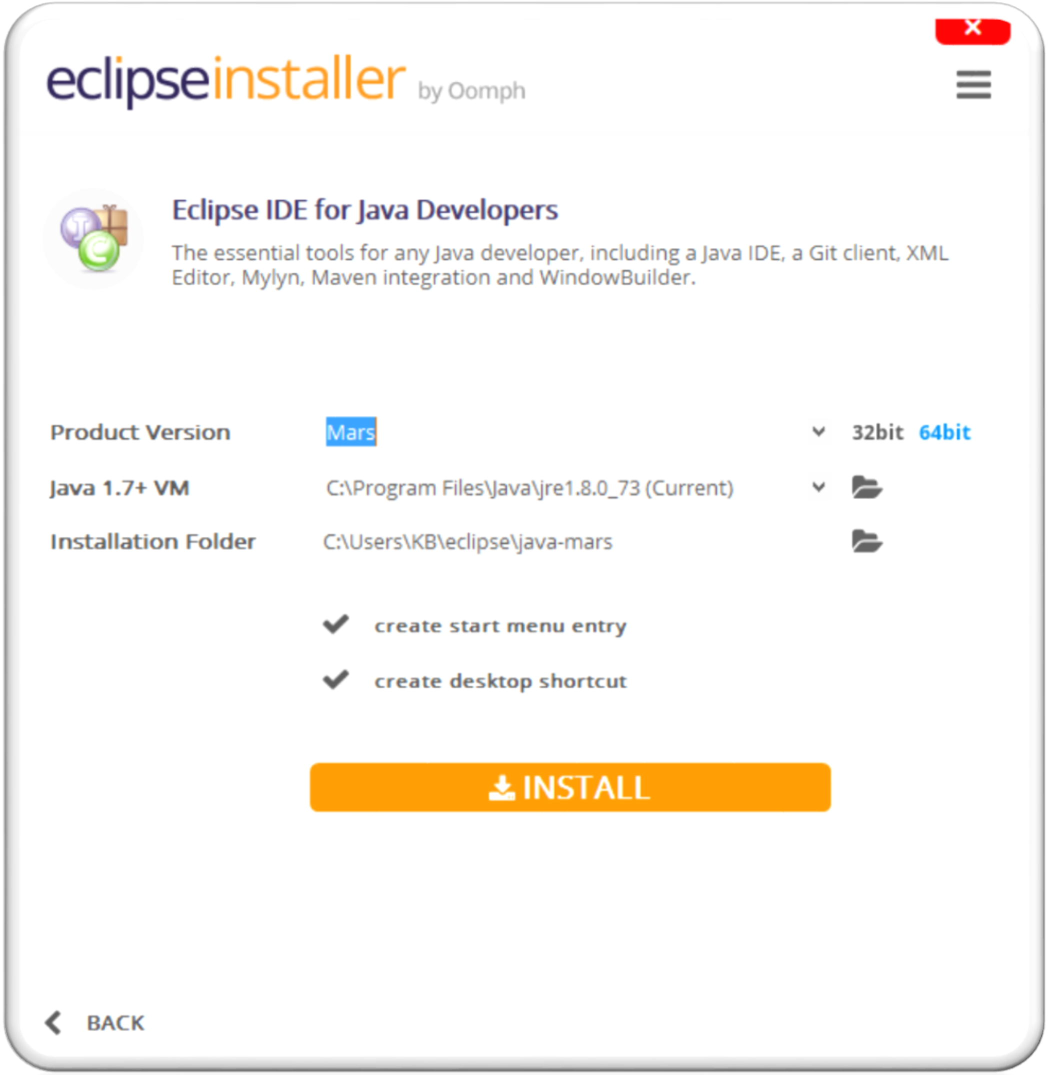
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Eclipse IDE for Java Developers

The essential tools for any Java developer, including a Java IDE, a Git client, XML Editor, Mylyn, Maven integration and WindowBuilder.

Product Version: Mars — 32bit 64bit

Java 1.7+ VM: C:\Program Files\Java\jre1.8.0_73 (Current)

Installation Folder: C:\Users\KB\eclipse\java-mars

✓ create start menu entry

✓ create desktop shortcut

INSTALL
BACK

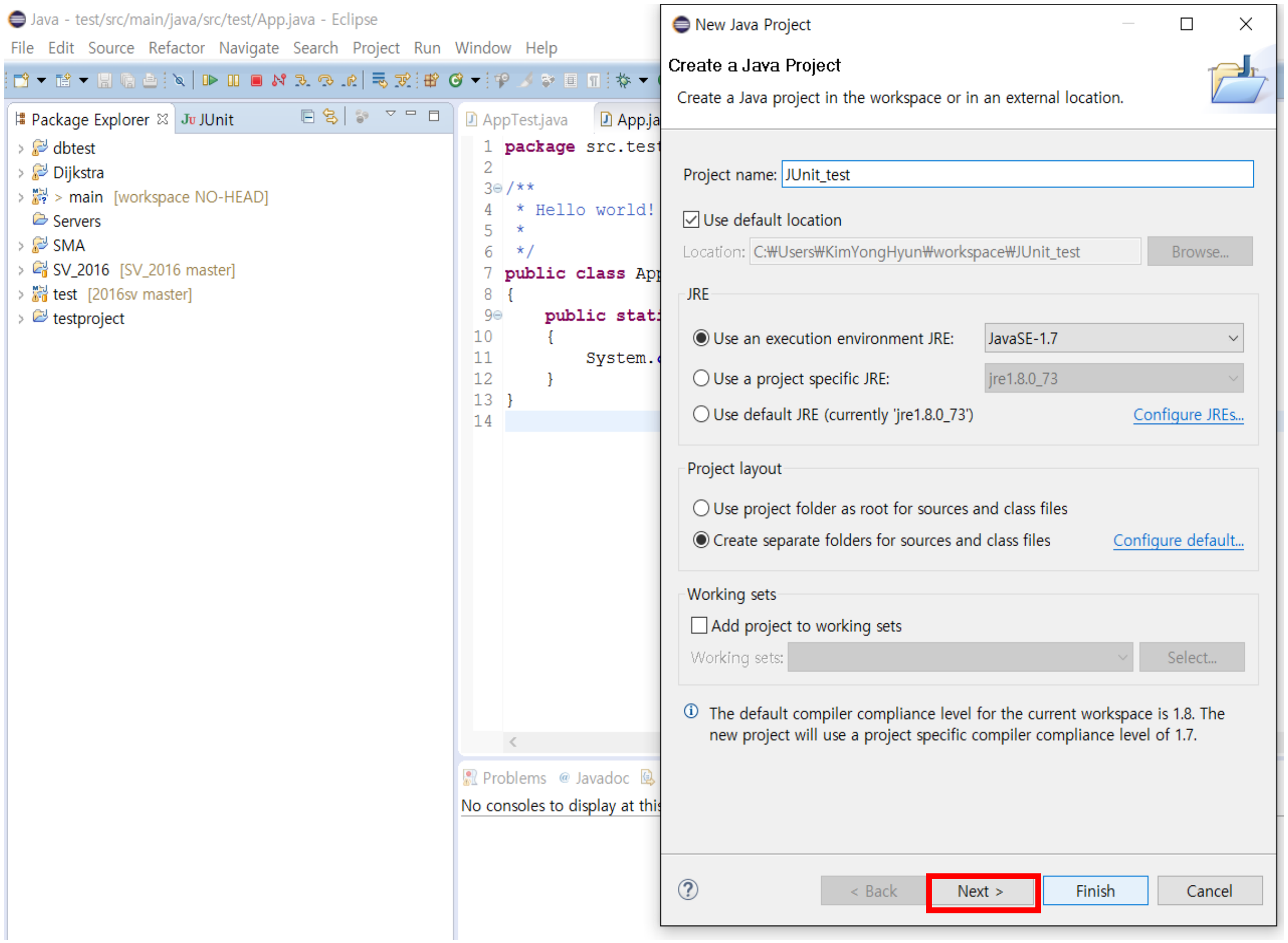
JUnit

Eclipse
Overall
설 치

- 소개
  - Junit은 Java기반 테스팅을 위한 프레임워크로, 단위모듈(ex Method)이 정확히 구현되었는지를 확인할 수 있는 도구
- 주요기능
  - Test case 생성 및 실행, 오류추적
- 특징
  - 메소드와 같은 단위 모듈 별 테스팅을 가능케 함으로써 코드 품질을 보장
  - 정확한 단위 테스팅을 가능케 함으로써 통합 테스팅 시 회귀결함을 줄임
  - 다른 모듈에 의존하지 않고, 원하는 모듈만 임의의 순서대로 수행할 수 있다.
  - JFeature(요구사항개발도구)와 통합되어 요구사항의 정확한 구현 비율을 알 수 있다.

JUnit

프로젝트 생성


Java - test/src/main/java/src/test/App.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Package Explorer
JUnit
dbtest
Dijkstra
> main [workspace NO-HEAD]
Servers
SMA
SV_2016 [SV_2016 master]
test [2016sv master]
testproject
AppTest.java
App.ja
Problems
Javadoc
Browse...
Select...
< Back
Next >
Finish
Cancel

```
package src.tes
/**
 * Hello world!
 *
 */
public class App
{
    public stati
    {
        System.
    }
}
```

No consoles to display at thi

New Java Project

Create a Java Project

Create a Java project in the workspace or in an external location.

Project name: JUnit_test

☑ Use default location

Location: C:₩Users₩KimYongHyun₩workspace₩JUnit_test

JRE

● Use an execution environment JRE: JavaSE-1.7

○ Use a project specific JRE: jre1.8.0_73

○ Use default JRE (currently 'jre1.8.0_73') Configure JREs...

Project layout

○ Use project folder as root for sources and class files

● Create separate folders for sources and class files Configure default...

Working sets

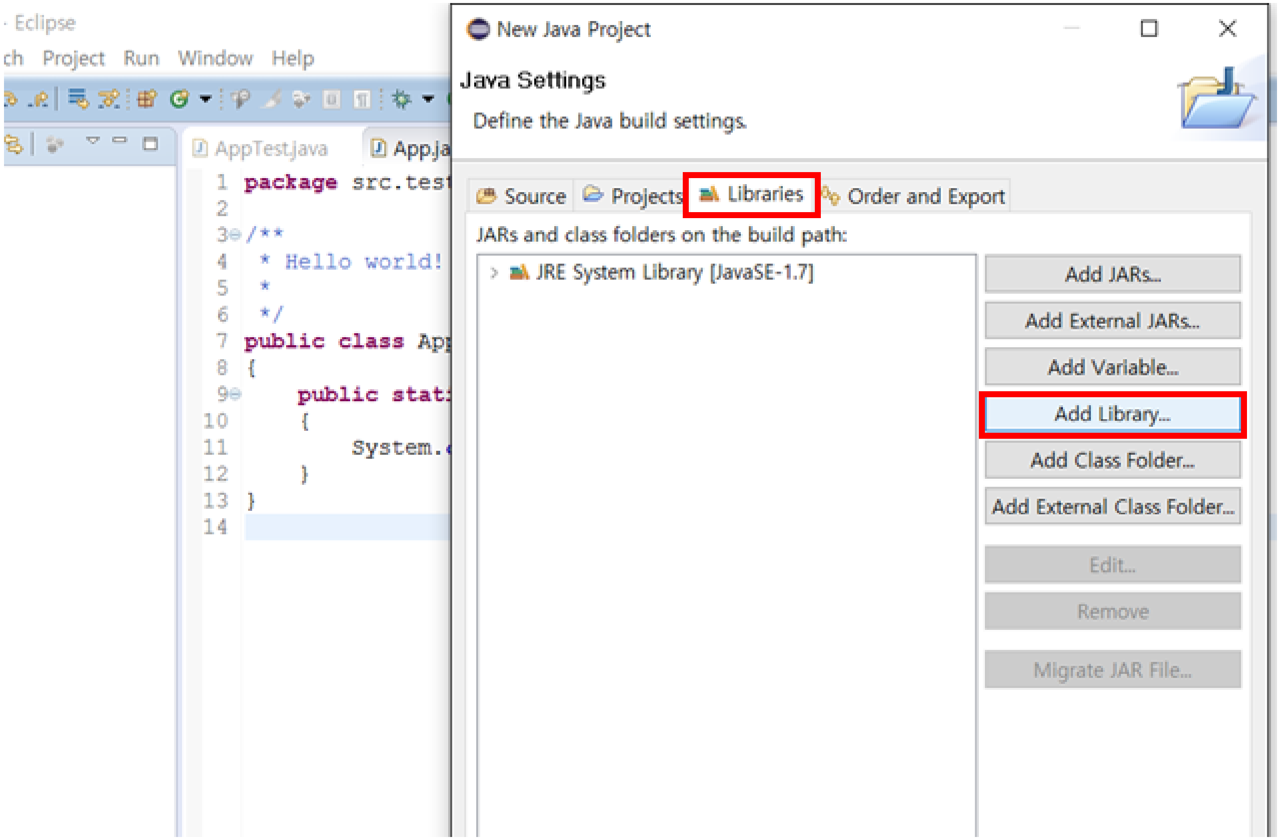
☐ Add project to working sets

Working sets:

The default compiler compliance level for the current workspace is 1.8. The new project will use a project specific compiler compliance level of 1.7.

JUnit

프로젝트 생성


Eclipse
ch Project Run Window Help
AppTest.java
App.ja
New Java Project
Source
Projects
Libraries
Order and Export
Add JARs...
Add External JARs...
Add Variable...
Add Library...
Add Class Folder...
Add External Class Folder...
Edit...
Remove
Migrate JAR File...

```
package src.test
/**
 * Hello world!
 *
 */
public class App
{
    public stat
    {
        System.
    }
}
```

Java Settings

Define the Java build settings.

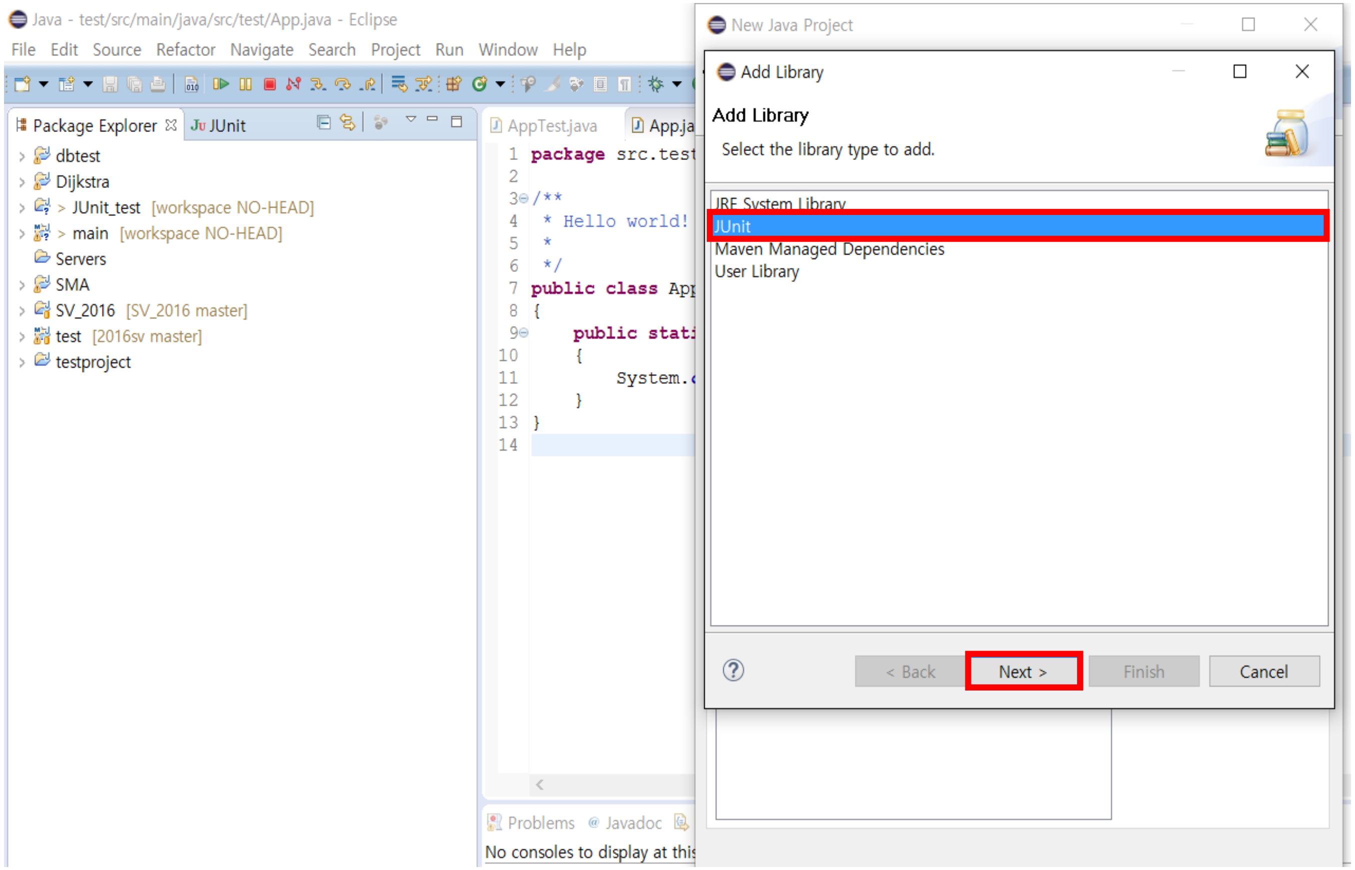
JARs and class folders on the build path:

- JRE System Library [JavaSE-1.7]

Junit 라이브러리 추가

JUnit

프로젝트 생성



Java - test/src/main/java/src/test/App.java - Eclipse

New Java Project

Add Library

Select the library type to add.

- JRE System Library
- JUnit
- Maven Managed Dependencies
- User Library

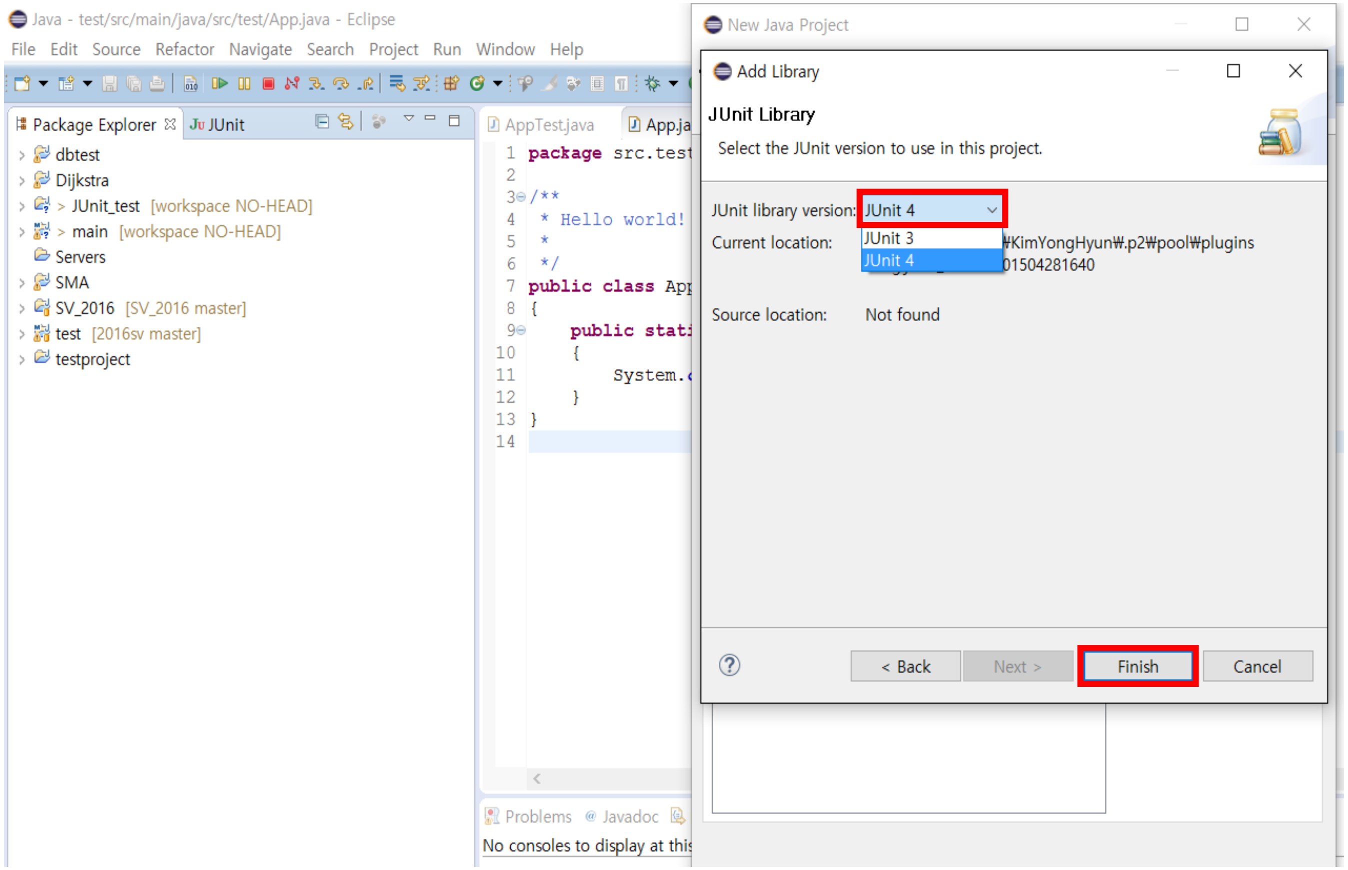
```
package src.test
/**
 * Hello world!
 *
 */
public class App
{
    public stati
    {
        System.
    }
}
```

No consoles to display at this

File Edit Source Refactor Navigate Search Project Run Window Help
Package Explorer
JUnit
dbtest
Dijkstra
> JUnit_test [workspace NO-HEAD]
> main [workspace NO-HEAD]
Servers
SMA
SV_2016 [SV_2016 master]
test [2016sv master]
testproject
AppTest.java
App.ja
Problems
Javadoc
< Back
Next >
Finish
Cancel

JUnit

프로젝트
생 성



Java - test/src/main/java/src/test/App.java - Eclipse

```
package src.test
/**
 * Hello world!
 *
 */
public class App
{
    public stati
    {
        System.
    }
}
```

Add Library

JUnit Library

Select the JUnit version to use in this project.

JUnit library version: JUnit 4

Current location: ₩KimYongHyun₩.p2₩pool₩plugins …01504281640

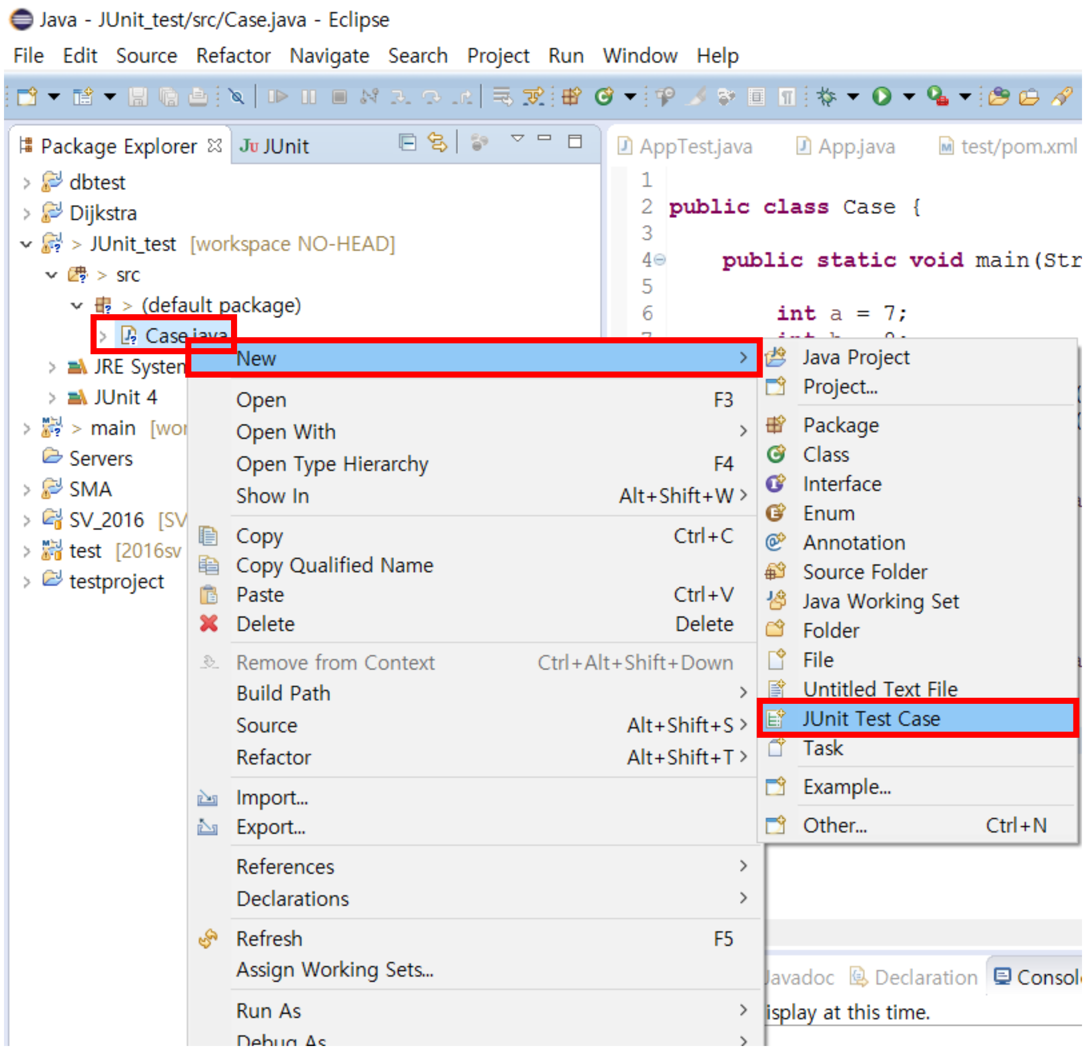
Source location: Not found

No consoles to display at this

New Java Project
File Edit Source Refactor Navigate Search Project Run Window Help
Package Explorer
JUnit
dbtest
Dijkstra
> JUnit_test [workspace NO-HEAD]
> main [workspace NO-HEAD]
Servers
SMA
SV_2016 [SV_2016 master]
test [2016sv master]
testproject
AppTest.java
App.ja
JUnit 3
JUnit 4
< Back
Next >
Finish
Cancel
Problems
Javadoc

JUnit

TestCase 생성

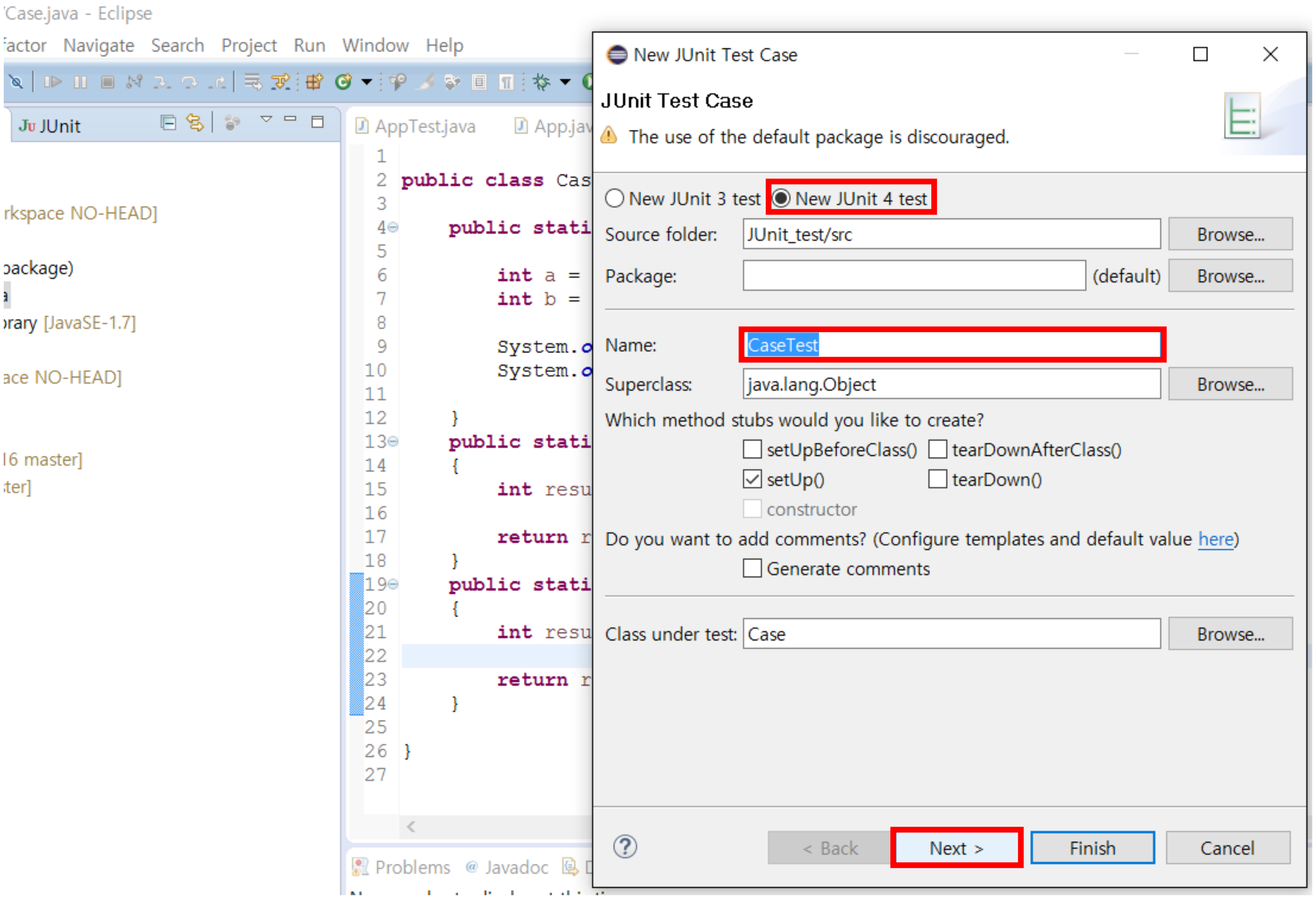


Java - JUnit_test/src/Case.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Package Explorer
JUnit
dbtest
Dijkstra
> JUnit_test [workspace NO-HEAD]
> src
> (default package)
Case.java
JRE System
JUnit 4
> main [wo
Servers
SMA
SV_2016 [SV
test [2016sv
testproject
AppTest.java
App.java
test/pom.xml
New
Open F3
Open With
Open Type Hierarchy F4
Show In Alt+Shift+W
Copy Ctrl+C
Copy Qualified Name
Paste Ctrl+V
Delete Delete
Remove from Context Ctrl+Alt+Shift+Down
Build Path
Source Alt+Shift+S
Refactor Alt+Shift+T
Import...
Export...
References
Declarations
Refresh F5
Assign Working Sets...
Run As
Debug As
Java Project
Project...
Package
Class
Interface
Enum
Annotation
Source Folder
Java Working Set
Folder
File
Untitled Text File
JUnit Test Case
Task
Example...
Other... Ctrl+N
Javadoc
Declaration
Consol
isplay at this time.

```
public class Case {

    public static void main(Str

        int a = 7;
```

JUnit

TestCase 생성


Case.java - Eclipse
actor Navigate Search Project Run Window Help
JUnit
AppTest.java
App.jav
Problems
Javadoc

New JUnit Test Case

JUnit Test Case

The use of the default package is discouraged.

○ New JUnit 3 test ● New JUnit 4 test

Source folder: JUnit_test/src

Package: (default)

Name: CaseTest

Superclass: java.lang.Object

Which method stubs would you like to create?

☐ setUpBeforeClass() ☐ tearDownAfterClass()

☑ setUp() ☐ tearDown()

☐ constructor

Do you want to add comments? (Configure templates and default value here)

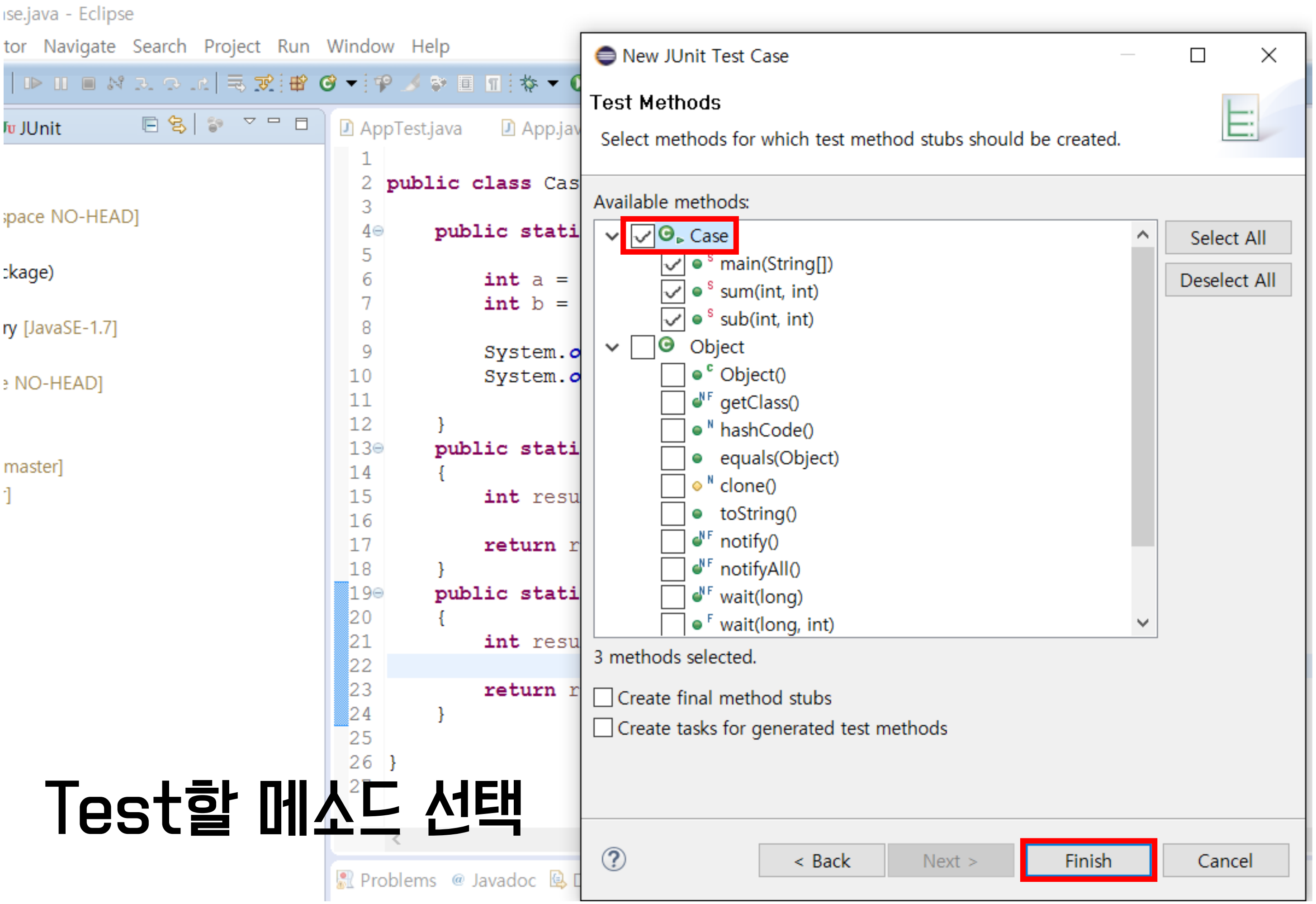
☐ Generate comments

Class under test: Case

Browse...
< Back
Next >
Finish
Cancel

JUnit

TestCase 생성


ɪse.java - Eclipse
tor Navigate Search Project Run Window Help
JUnit
AppTest.java
App.jav
ɪpace NO-HEAD]
ɪkage)
ry [JavaSE-1.7]
ɜ NO-HEAD]
master]
]
Problems
Javadoc
New JUnit Test Case
Select All
Deselect All
< Back
Next >
Finish
Cancel

```
public class Cas

    public stati

        int a =
        int b =

        System.o
        System.o

    }
    public stati
    {
        int resu

        return r
    }
    public stati
    {
        int resu

        return r
    }
}
```

Test Methods

Select methods for which test method stubs should be created.

Available methods:

- ☑ Case
  - ☑ main(String[])
  - ☑ sum(int, int)
  - ☑ sub(int, int)
- ☐ Object
  - ☐ Object()
  - ☐ getClass()
  - ☐ hashCode()
  - ☐ equals(Object)
  - ☐ clone()
  - ☐ toString()
  - ☐ notify()
  - ☐ notifyAll()
  - ☐ wait(long)
  - ☐ wait(long, int)

3 methods selected.

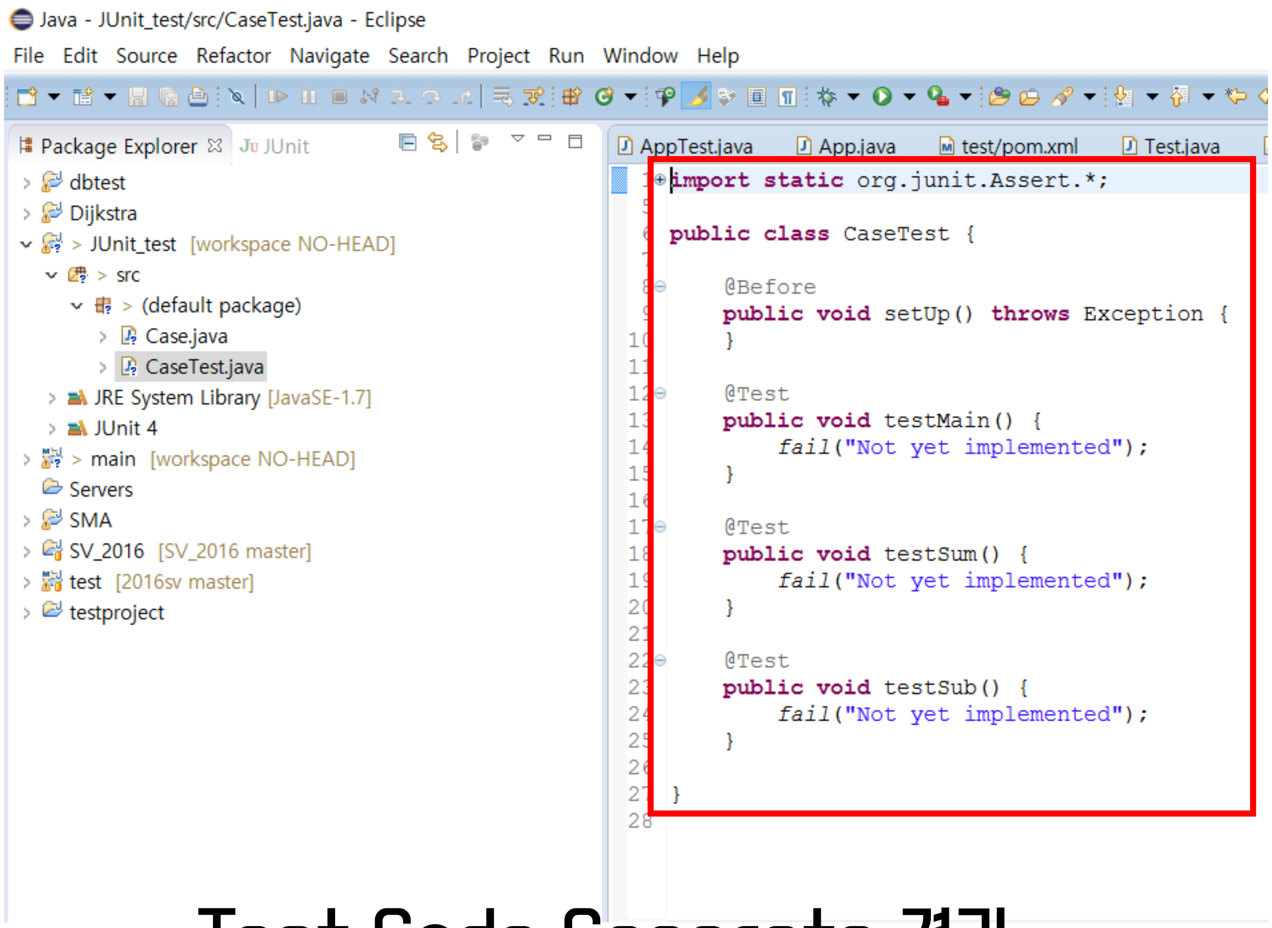
☐ Create final method stubs

☐ Create tasks for generated test methods

Test할 메소드 선택

JUnit

TestCase Code

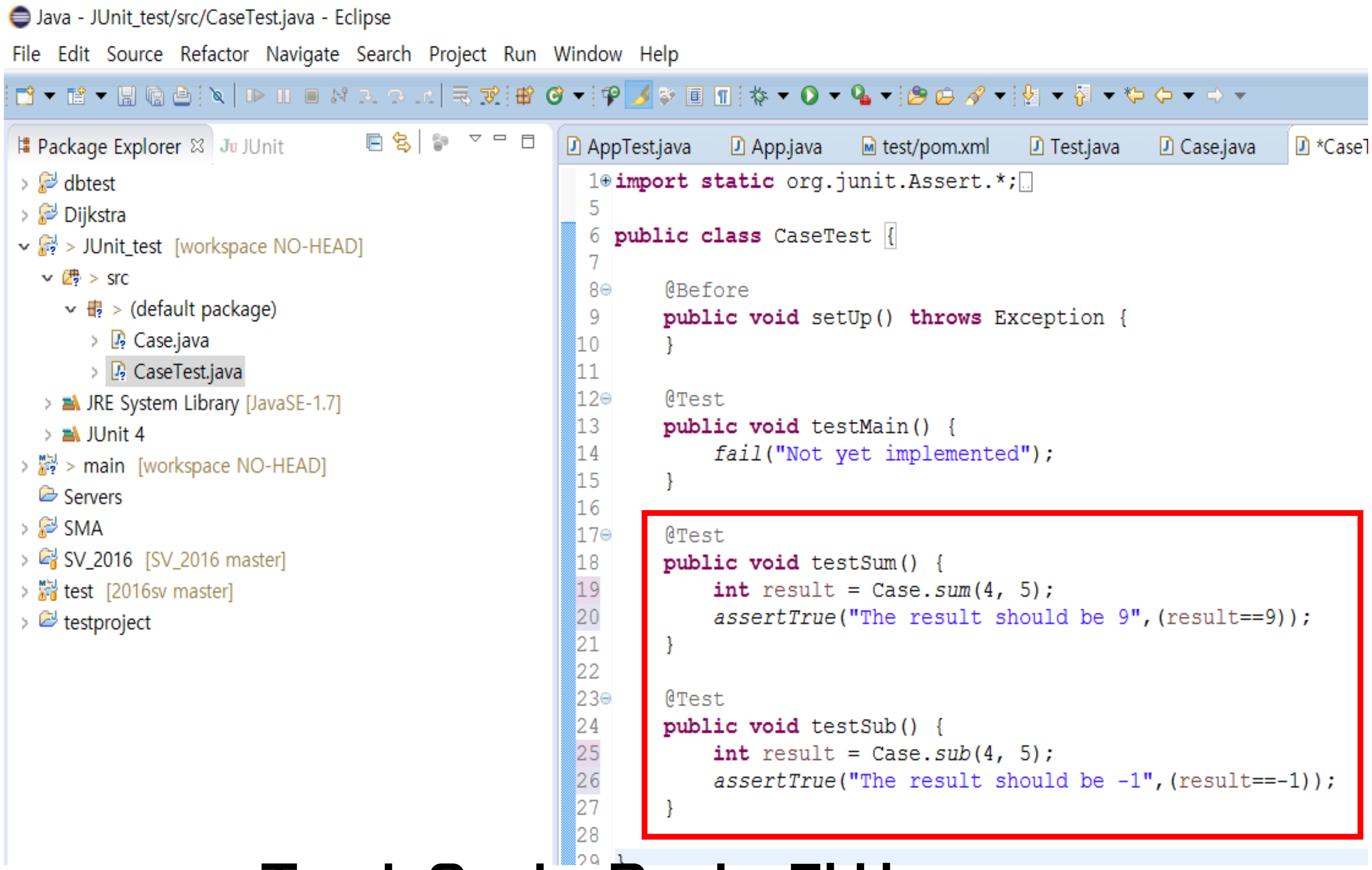

Java - JUnit_test/src/CaseTest.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Package Explorer
JUnit
dbtest
Dijkstra
> JUnit_test [workspace NO-HEAD]
> src
> (default package)
Case.java
CaseTest.java
JRE System Library [JavaSE-1.7]
JUnit 4
> main [workspace NO-HEAD]
Servers
SMA
SV_2016 [SV_2016 master]
test [2016sv master]
testproject
AppTest.java
App.java
test/pom.xml
Test.java

```java
import static org.junit.Assert.*;

public class CaseTest {

    @Before
    public void setUp() throws Exception {
    }

    @Test
    public void testMain() {
        fail("Not yet implemented");
    }

    @Test
    public void testSum() {
        fail("Not yet implemented");
    }

    @Test
    public void testSub() {
        fail("Not yet implemented");
    }

}
```

Test Code Generate 결과

JUnit

TestCase Code


Java - JUnit_test/src/CaseTest.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Package Explorer
JUnit
dbtest
Dijkstra
> JUnit_test [workspace NO-HEAD]
> src
> (default package)
Case.java
CaseTest.java
JRE System Library [JavaSE-1.7]
JUnit 4
> main [workspace NO-HEAD]
Servers
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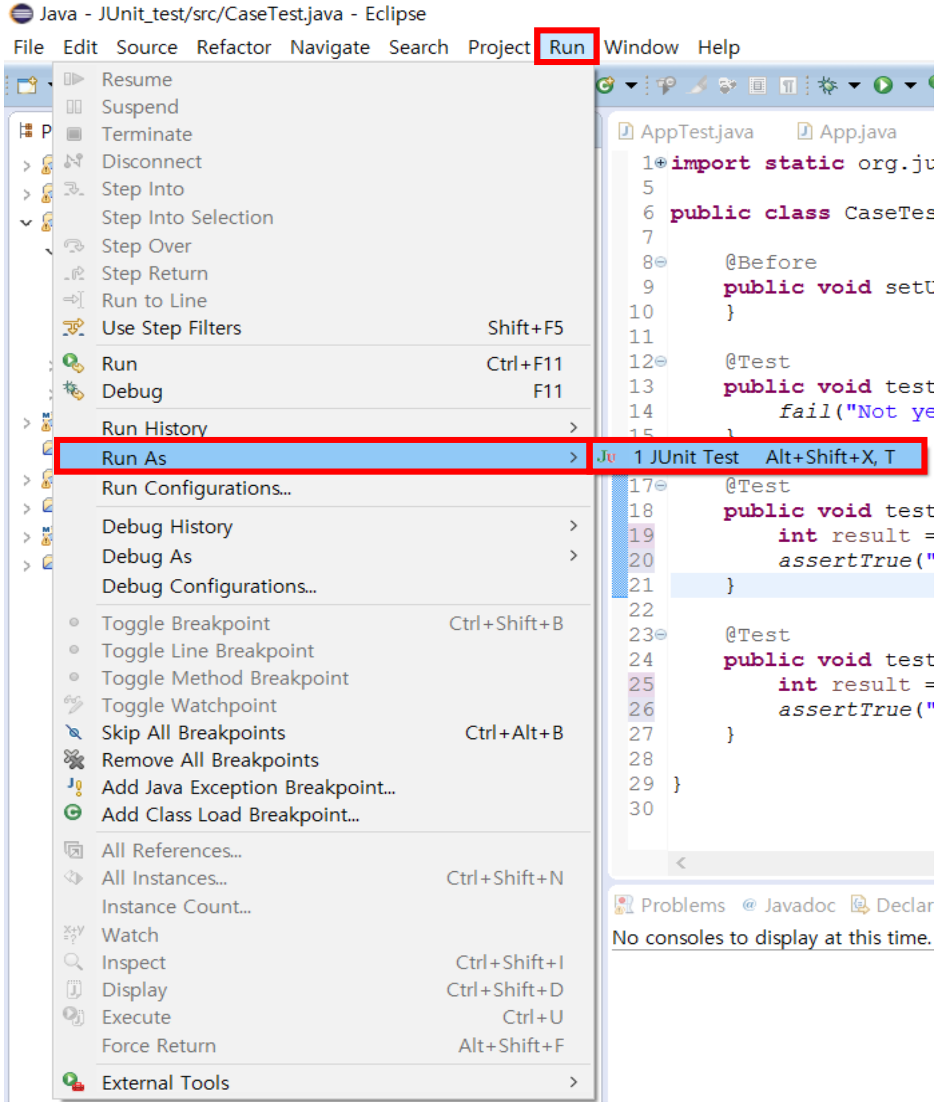
SV_2016 [SV_2016 master]
test [2016sv master]
testproject
AppTest.java
App.java
test/pom.xml
Test.java
Case.java
*CaseT

```
import static org.junit.Assert.*;

public class CaseTest {

    @Before
    public void setUp() throws Exception {
    }

    @Test
    public void testMain() {
        fail("Not yet implemented");
    }

    @Test
    public void testSum() {
        int result = Case.sum(4, 5);
        assertTrue("The result should be 9",(result==9));
    }

    @Test
    public void testSub() {
        int result = Case.sub(4, 5);
        assertTrue("The result should be -1",(result==-1));
    }

}
```

Test Code Body 작성

JUnit

TestCase Code

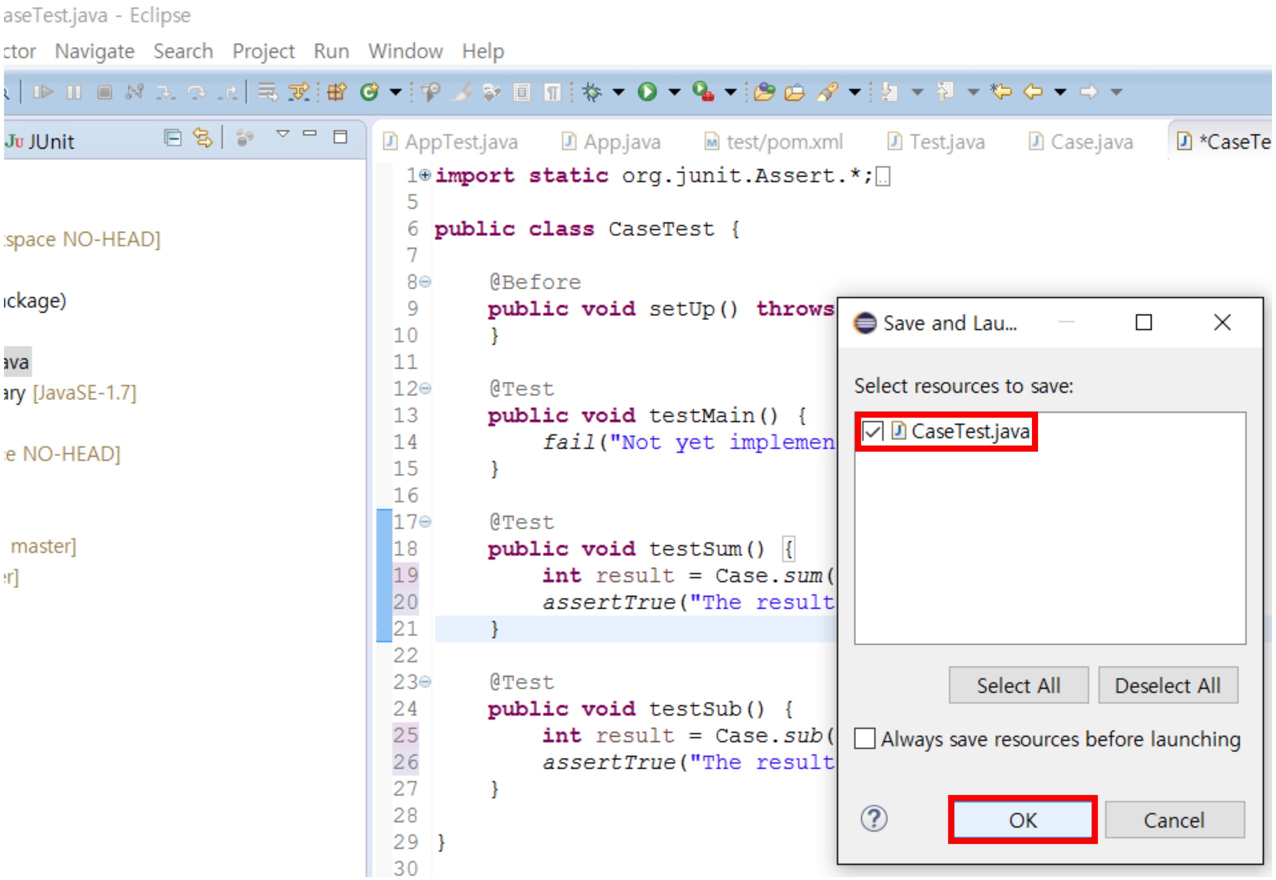

Java - JUnit_test/src/CaseTest.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Resume
Suspend
Terminate
Disconnect
Step Into
Step Into Selection
Step Over
Step Return
Run to Line
Use Step Filters Shift+F5
Run Ctrl+F11
Debug F11
Run History
Run As
1 JUnit Test Alt+Shift+X, T
Run Configurations...
Debug History
Debug As
Debug Configurations...
Toggle Breakpoint Ctrl+Shift+B
Toggle Line Breakpoint
Toggle Method Breakpoint
Toggle Watchpoint
Skip All Breakpoints Ctrl+Alt+B
Remove All Breakpoints
Add Java Exception Breakpoint...
Add Class Load Breakpoint...
All References...
All Instances... Ctrl+Shift+N
Instance Count...
Watch
Inspect Ctrl+Shift+I
Display Ctrl+Shift+D
Execute Ctrl+U
Force Return Alt+Shift+F
External Tools
AppTest.java
App.java
Problems
Javadoc
Declar

```
import static org.ju

public class CaseTes

    @Before
    public void setU
    }

    @Test
    public void test
        fail("Not ye

    @Test
    public void test
        int result =
        assertTrue("
    }

    @Test
    public void test
        int result =
        assertTrue("
    }

}
```

No consoles to display at this time.

JUnit

TestCase Code


aseTest.java - Eclipse
ctor Navigate Search Project Run Window Help
JUnit
AppTest.java
App.java
test/pom.xml
Test.java
Case.java
*CaseTe
space NO-HEAD]
ckage)
ava
ary [JavaSE-1.7]
e NO-HEAD]
master]
r]

```
import static org.junit.Assert.*;

public class CaseTest {

    @Before
    public void setUp() throws
    }

    @Test
    public void testMain() {
        fail("Not yet implemen
    }

    @Test
    public void testSum() {
        int result = Case.sum(
        assertTrue("The result
    }

    @Test
    public void testSub() {
        int result = Case.sub(
        assertTrue("The result
    }

}
```

Save and Lau...

Select resources to save:

☑ CaseTest.java

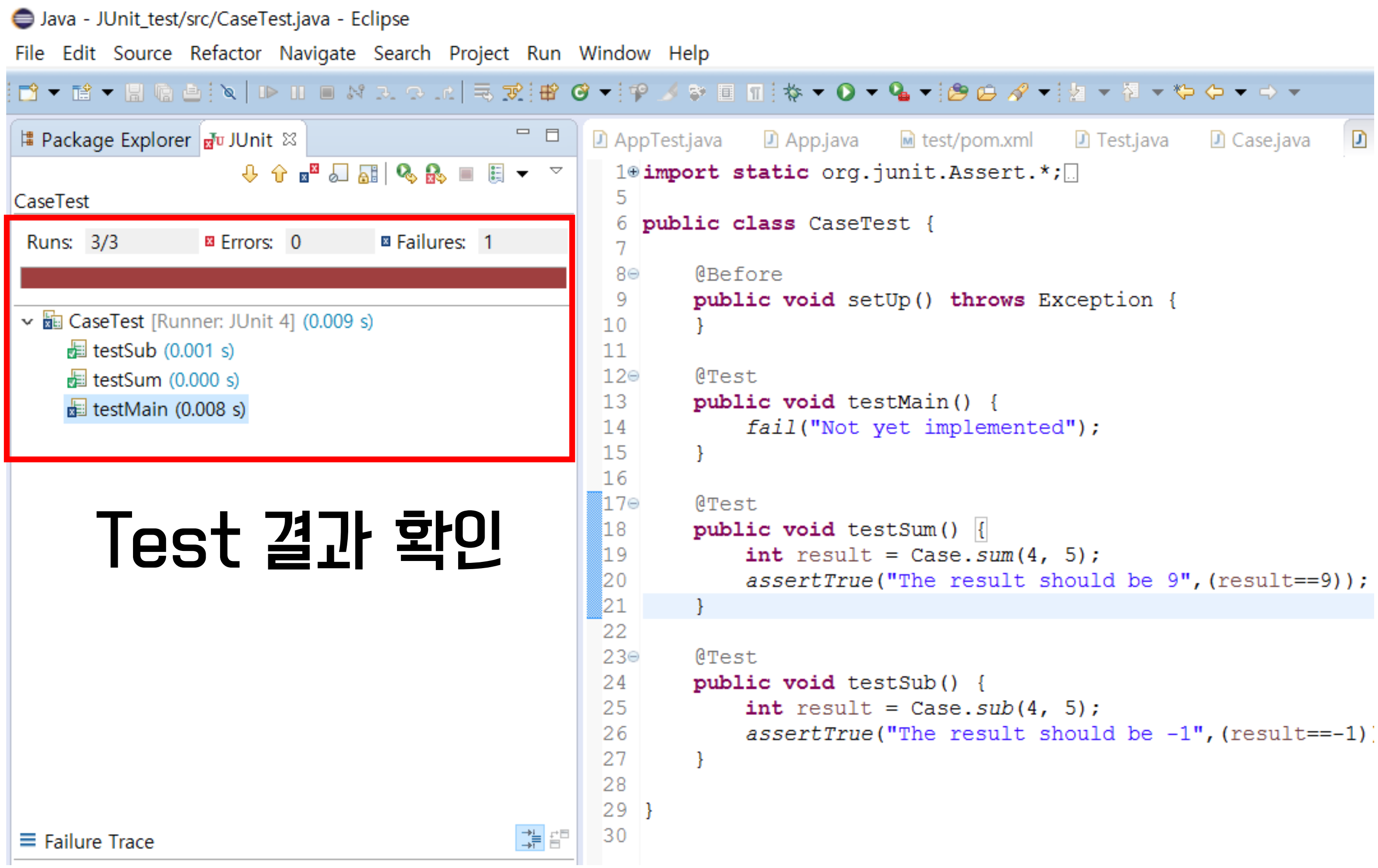
Select All | Deselect All

☐ Always save resources before launching

OK | Cancel

JUnit

TestCase Code


Java - JUnit_test/src/CaseTest.java - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Package Explorer
JUnit
AppTest.java
App.java
test/pom.xml
Test.java
Case.java
CaseTest
Failure Trace

```
Runs: 3/3    Errors: 0    Failures: 1

CaseTest [Runner: JUnit 4] (0.009 s)
    testSub (0.001 s)
    testSum (0.000 s)
    testMain (0.008 s)
```

```java
import static org.junit.Assert.*;

public class CaseTest {

    @Before
    public void setUp() throws Exception {
    }

    @Test
    public void testMain() {
        fail("Not yet implemented");
    }

    @Test
    public void testSum() {
        int result = Case.sum(4, 5);
        assertTrue("The result should be 9",(result==9));
    }

    @Test
    public void testSub() {
        int result = Case.sub(4, 5);
        assertTrue("The result should be -1",(result==-1)
    }

}
```

Test 결과 확인

JUnit

JUnit Test Method

Method

Method	설명
assertEquals(a,b)	객체 a,b가 서로 일치하는지 확인
assertArrayEquals(a,b)	배열 a,b가 일치하는지 확인(순서 포함)
assertNull(a)	객체가 Null을 참조하는지 시험
assertNotNull(a)	객체가 실존하는 객체를 확인하는지 시험
assertTure(a)	조건식 a가 참인지 확인
assertFalse(a)	조건식 a가 False인지 확인
assertSame(a,b)	a가 참조하는 객체를 b도 참조하는지 시험
assertNotSame(a,b)	a와 b가 서로 다른 객체를 참조하는지 시험
Fail()	테스트 결과를 실패로 처리
기타	http://junit.sourceforge.net/javadoc/org/junit/Assert.html

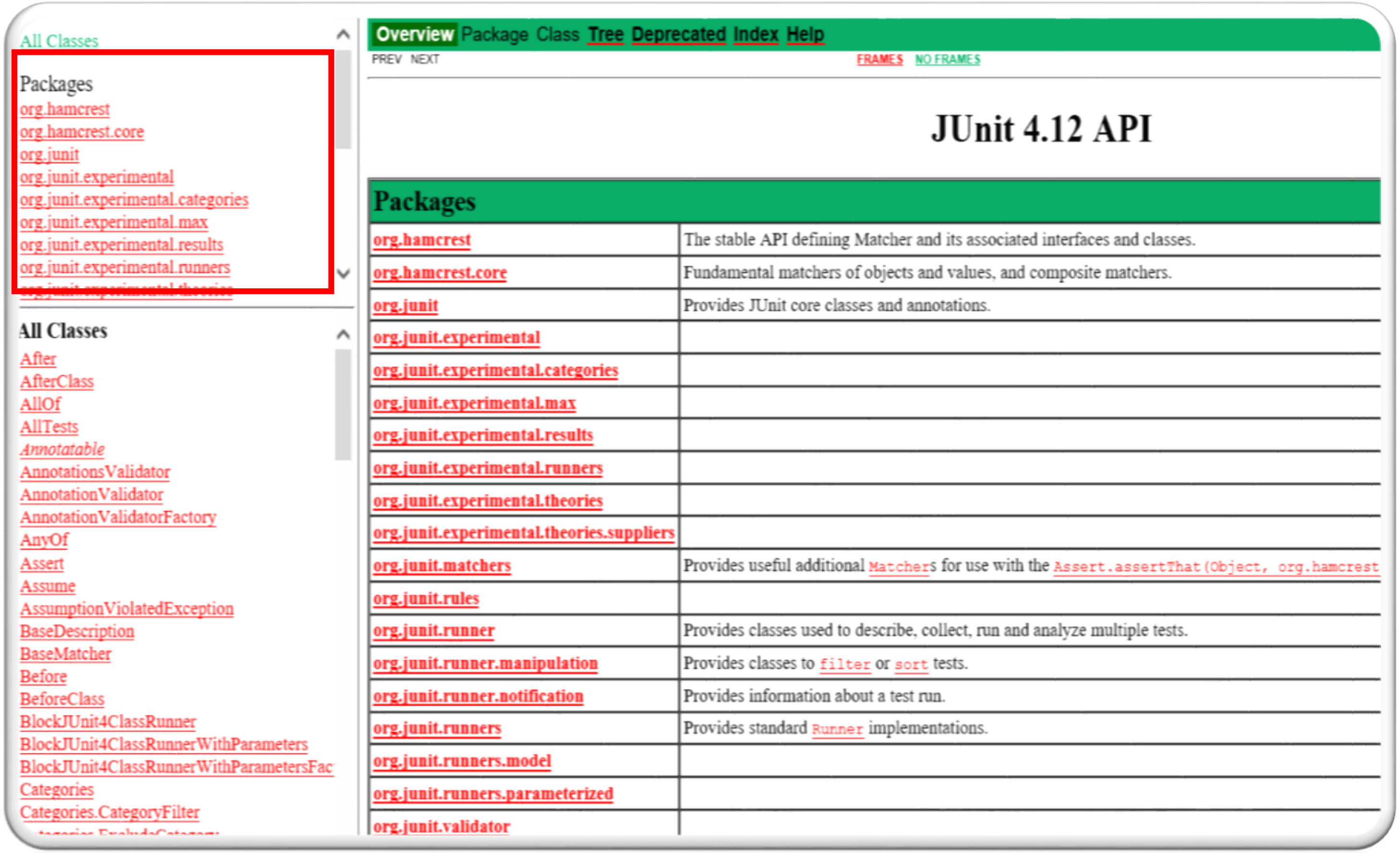
JUnit of Annotation

Annotation

Annotation	설명
@Test	Unit Test를 수행하는 대상 method
@Before	각 Unit test의 method 실행 전에 실행되는 method
@After	각 Unit test의 실행 후에 실행되는 method
@BeforeClass	Class안에 정의된 모든 method에 대해서 Test 전, 후에 한번만 호출된다. 객체 생성 등에 사용.
@AfterClass	
@Ignore	테스트를 수행하지 않을 method
@RunWith(value=class)	Unit Test 클래스를 실행하기 위한 러너(Runner)를 명시적으로 지정할 수 있다.
@SuiteClasses (value=class)	보통 여러 개의 Test Class를 수행하기 위해 쓰인다. @Runwith를 이용해 Suite Class를 러너로 사용한다.
@Parameter	하나의 method에 대해 다양한 테스트 값을 한꺼번에 실행시키고자 할 때 사용한다.

http://junit.org/javadoc/latest/index.html

API



All Classes

Packages
- org.hamcrest
- org.hamcrest.core
- org.junit
- org.junit.experimental
- org.junit.experimental.categories
- org.junit.experimental.max
- org.junit.experimental.results
- org.junit.experimental.runners
- org.junit.experimental.theories

All Classes
- After
- AfterClass
- AllOf
- AllTests
- *Annotatable*
- AnnotationsValidator
- AnnotationValidator
- AnnotationValidatorFactory
- AnyOf
- Assert
- Assume
- AssumptionViolatedException
- BaseDescription
- BaseMatcher
- Before
- BeforeClass
- BlockJUnit4ClassRunner
- BlockJUnit4ClassRunnerWithParameters
- BlockJUnit4ClassRunnerWithParametersFac
- Categories
- Categories.CategoryFilter

JUnit 4.12 API

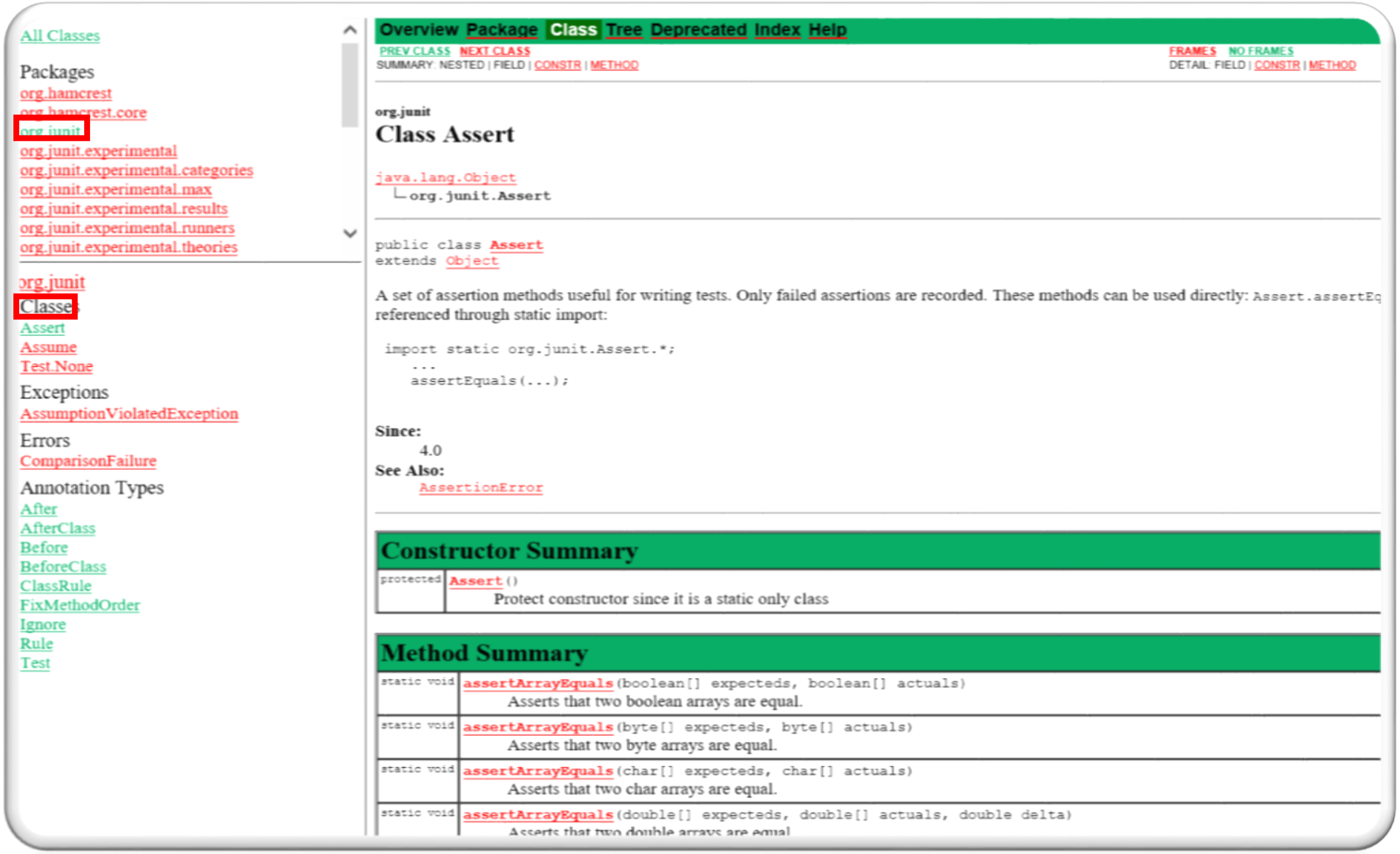
Packages

org.hamcrest	The stable API defining Matcher and its associated interfaces and classes.
org.hamcrest.core	Fundamental matchers of objects and values, and composite matchers.
org.junit	Provides JUnit core classes and annotations.
org.junit.experimental	
org.junit.experimental.categories	
org.junit.experimental.max	
org.junit.experimental.results	
org.junit.experimental.runners	
org.junit.experimental.theories	
org.junit.experimental.theories.suppliers	
org.junit.matchers	Provides useful additional `Matcher`s for use with the `Assert.assertThat(Object, org.hamcrest`
org.junit.rules	
org.junit.runner	Provides classes used to describe, collect, run and analyze multiple tests.
org.junit.runner.manipulation	Provides classes to `filter` or `sort` tests.
org.junit.runner.notification	Provides information about a test run.
org.junit.runners	Provides standard `Runner` implementations.
org.junit.runners.model	
org.junit.runners.parameterized	
org.junit.validator	

JUnit

http://junit.org/javadoc/latest/index.html

API



All Classes

Packages
- org.hamcrest
- org.hamcrest.core
- org.junit
- org.junit.experimental
- org.junit.experimental.categories
- org.junit.experimental.max
- org.junit.experimental.results
- org.junit.experimental.runners
- org.junit.experimental.theories

org.junit

Classes
- Assert
- Assume
- Test.None

Exceptions
- AssumptionViolatedException

Errors
- ComparisonFailure

Annotation Types
- After
- AfterClass
- Before
- BeforeClass
- ClassRule
- FixMethodOrder
- Ignore
- Rule
- Test

Overview Package Class Tree Deprecated Index Help
PREV CLASS NEXT CLASS
FRAMES NO FRAMES
SUMMARY: NESTED | FIELD | CONSTR | METHOD
DETAIL: FIELD | CONSTR | METHOD

org.junit

Class Assert

```
java.lang.Object
  └org.junit.Assert
```

```
public class Assert
extends Object
```

A set of assertion methods useful for writing tests. Only failed assertions are recorded. These methods can be used directly: `Assert.assertEq` referenced through static import:

```
 import static org.junit.Assert.*;
    ...
    assertEquals(...);
```

Since:
4.0

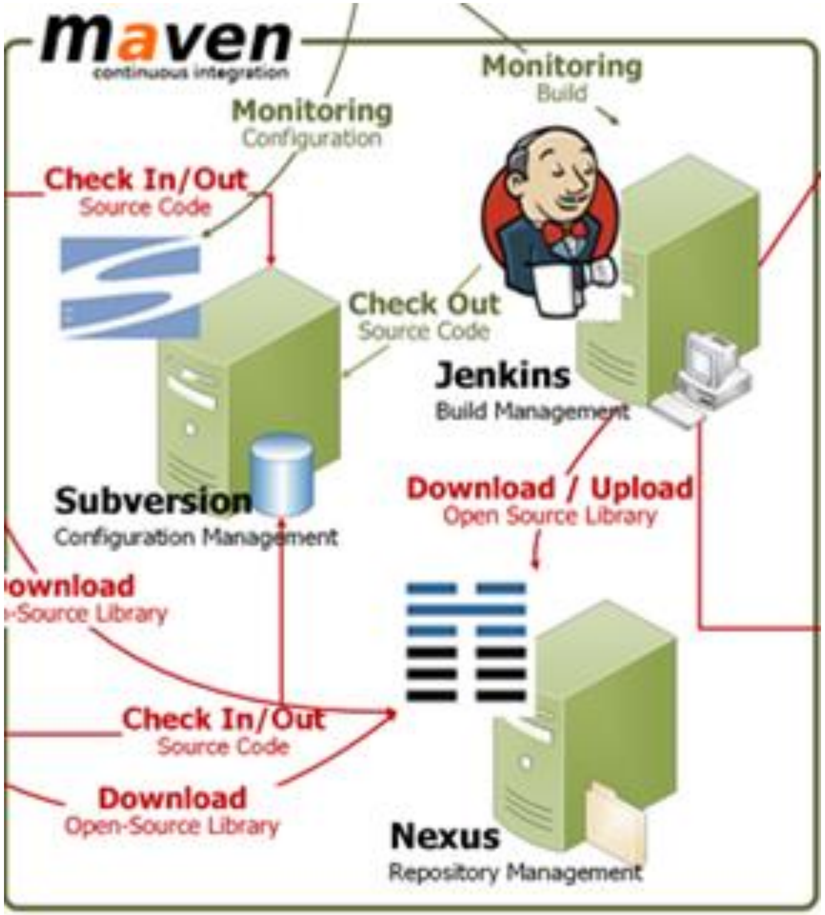
See Also:
`AssertionError`

Constructor Summary	
`protected`	`Assert()` Protect constructor since it is a static only class

Method Summary	
`static void`	`assertArrayEquals(boolean[] expecteds, boolean[] actuals)` Asserts that two boolean arrays are equal.
`static void`	`assertArrayEquals(byte[] expecteds, byte[] actuals)` Asserts that two byte arrays are equal.
`static void`	`assertArrayEquals(char[] expecteds, char[] actuals)` Asserts that two char arrays are equal.
`static void`	`assertArrayEquals(double[] expecteds, double[] actuals, double delta)` Asserts that two double arrays are equal

빌드환경

API


maven
continuous integration
Monitoring
Build
Monitoring
Configuration
Check In/Out
Source Code
Check Out
Source Code
Jenkins
Build Management
Subversion
Configuration Management
Download / Upload
Open Source Library
ownload
-Source Library
Check In/Out
Source Code
Download
Open-Source Library
Nexus
Repository Management

빌드 서버
- Jenkins

빌드 도구
- Maven

Jenkins

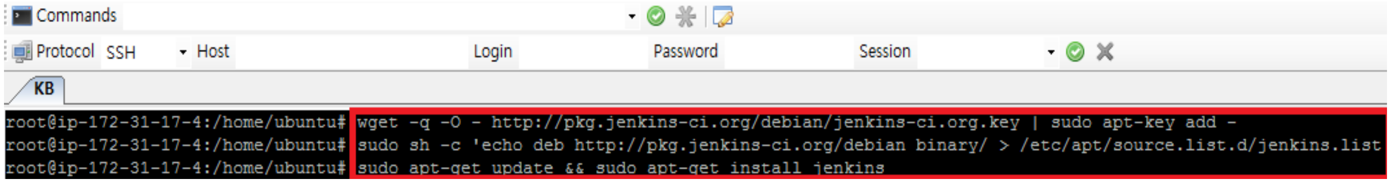
Overall

- 소개
  - CI(연속적 통합) 도구
  - 빌드, 배포 등 반복되는 작업을 모니터링 하는 도구
- 주요기능
  - 지속적인 자동화 빌드
  - 지속적인 자동화 테스트
  - 잡 스케줄링
  - 자동화된 배포 관리
- 특징
  - 쉬운 설치 및 웹 기반으로 된 쉬운 UI 제공
  - 여러 project 동시 Build 제공
  - 다양한 언어/OS 지원

Jenkins

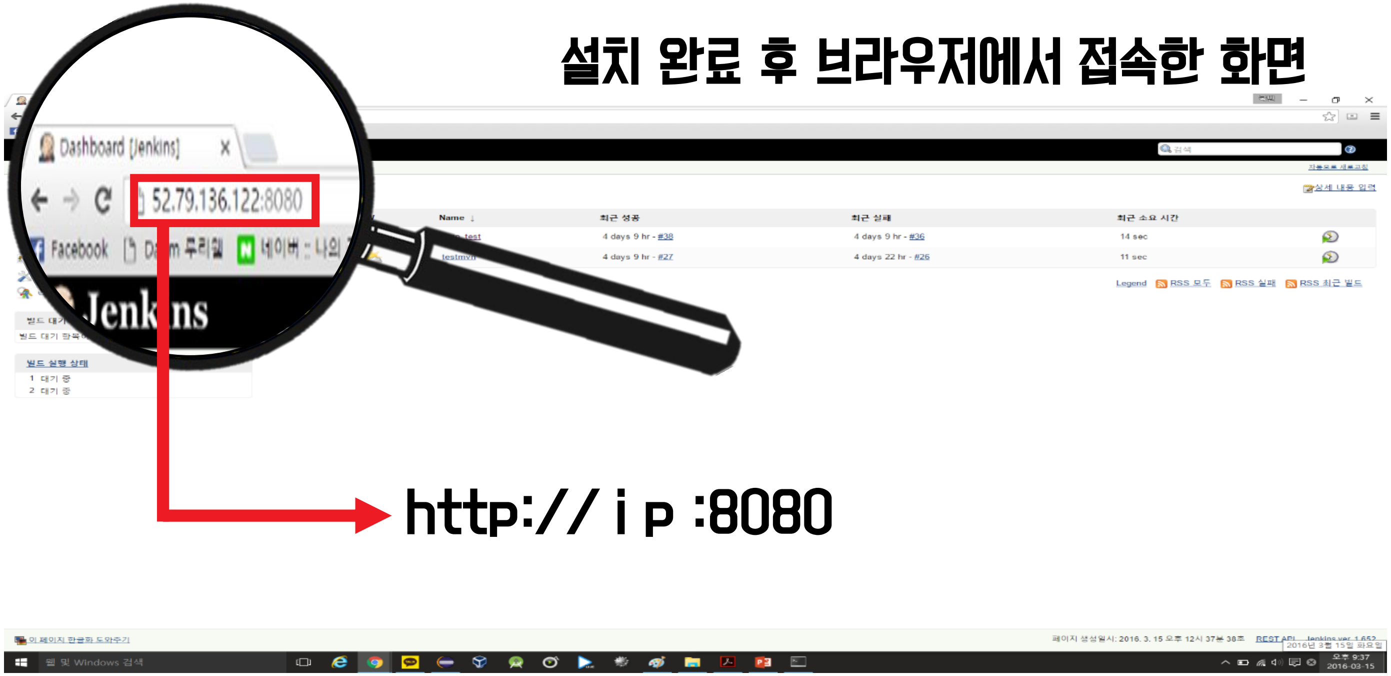
Jenkins 설 치

OS : Linux Ubuntu 14.04 64bit Server


Commands
Protocol SSH
Host
Login
Password
Session
KB

```
root@ip-172-31-17-4:/home/ubuntu# wget -q -O - http://pkg.jenkins-ci.org/debian/jenkins-ci.org.key | sudo apt-key add -
root@ip-172-31-17-4:/home/ubuntu# sudo sh -c 'echo deb http://pkg.jenkins-ci.org/debian binary/ > /etc/apt/source.list.d/jenkins.list
root@ip-172-31-17-4:/home/ubuntu# sudo apt-get update && sudo apt-get install jenkins
```

설치 완료 후 브라우저에서 접속한 화면


Dashboard [Jenkins]
52.79.136.122:8080
Facebook
Jenkins

http:// i p :8080

Maven

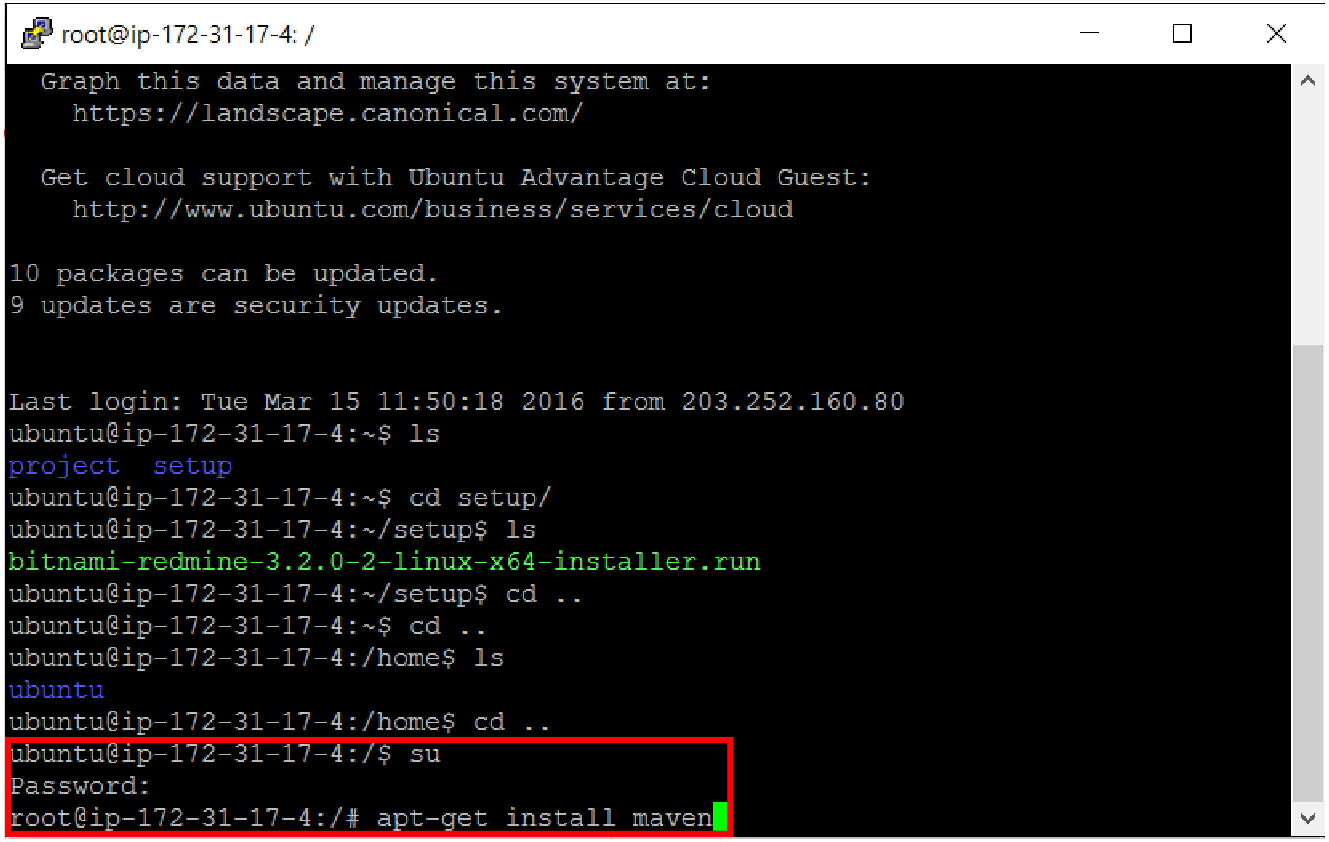
Overall

- 소개
  - 자바 기반 프로젝트를 빌드하고, 구성요소 및 라이브러리 의존성을 관리하는 도구
- 주요기능
  - 빌드 로직의 재사용 및 빌드 관리
  - 프로젝트 스캐폴딩
  - 의존성 관리
  - 원격 리파지토리 제공
  - 빌드, 패키지, 로컬 설치, 원격 배포
- 특징
  - 프로젝트에 필요한 라이브러리를 POM 파일 만으로 쉽게 구성 가능
  - Convention over Configuration 개념으로 관례적인 프로젝트 폴더 구조 사용
  - Jenkins 같은 CI 도구와 연계하여 빌드 과정 자동화 가능

Maven

Maven
설 치

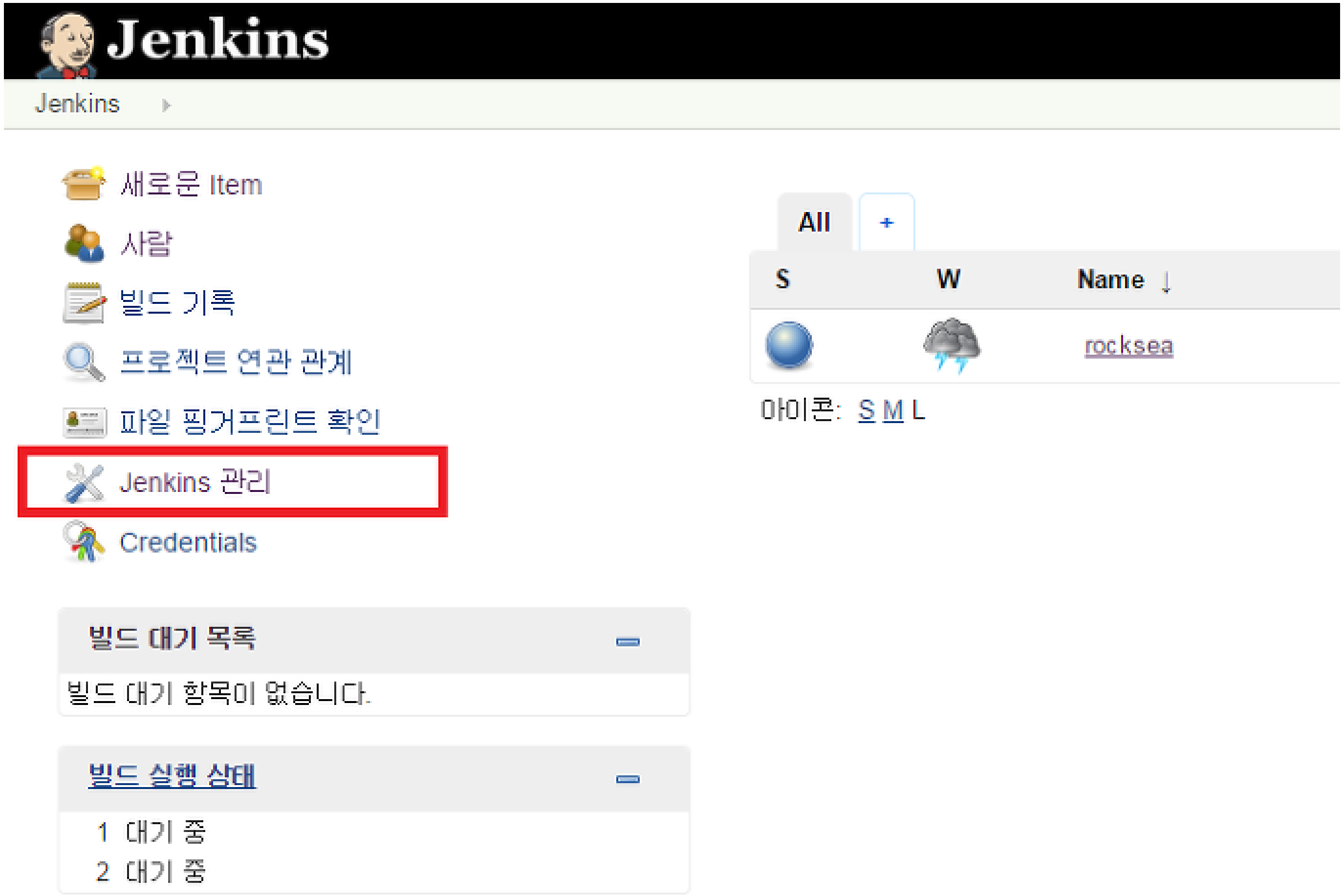
OS : Linux Ubuntu 14.04 64bit Server



```
  Graph this data and manage this system at:
    https://landscape.canonical.com/

  Get cloud support with Ubuntu Advantage Cloud Guest:
    http://www.ubuntu.com/business/services/cloud

10 packages can be updated.
9 updates are security updates.


Last login: Tue Mar 15 11:50:18 2016 from 203.252.160.80
ubuntu@ip-172-31-17-4:~$ ls
project  setup
ubuntu@ip-172-31-17-4:~$ cd setup/
ubuntu@ip-172-31-17-4:~/setup$ ls
bitnami-redmine-3.2.0-2-linux-x64-installer.run
ubuntu@ip-172-31-17-4:~/setup$ cd ..
ubuntu@ip-172-31-17-4:~$ cd ..
ubuntu@ip-172-31-17-4:/home$ ls
ubuntu
ubuntu@ip-172-31-17-4:/home$ cd ..
ubuntu@ip-172-31-17-4:/$ su
Password:
root@ip-172-31-17-4:/# apt-get install maven
```

Maven

Jenkins 연 동



Jenkins

Jenkins

- 새로운 Item
- 사람
- 빌드 기록
- 프로젝트 연관 관계
- 파일 핑거프린트 확인
- Jenkins 관리
- Credentials

빌드 대기 목록

빌드 대기 항목이 없습니다.

빌드 실행 상태

1 대기 중
2 대기 중

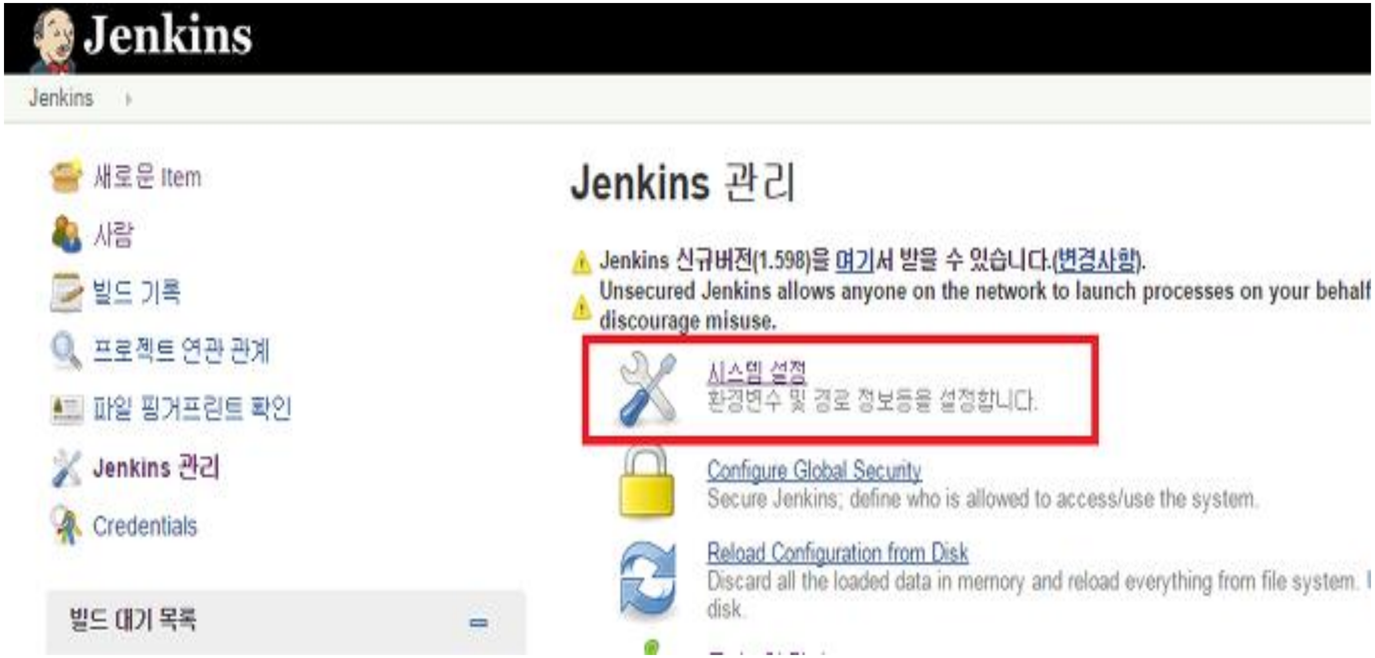
S	W	Name ↓
●		rocksea

아이콘: S M L

Jenkins 관리

Maven

Jenkins
연 동



Jenkins
Jenkins
새로운 Item
사람
빌드 기록
프로젝트 연관 관계
파일 핑거프린트 확인
Jenkins 관리
Credentials
빌드 대기 목록

Jenkins 관리

Jenkins 신규버전(1.598)을 여기서 받을 수 있습니다.(변경사항).

Unsecured Jenkins allows anyone on the network to launch processes on your behalf
discourage misuse.

시스템 설정
환경변수 및 경로 정보등을 설정합니다.

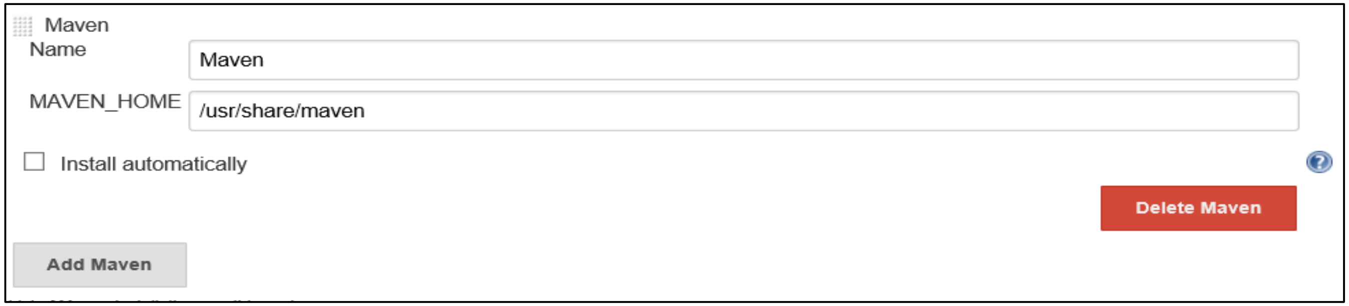
Configure Global Security
Secure Jenkins; define who is allowed to access/use the system.

Reload Configuration from Disk
Discard all the loaded data in memory and reload everything from file system.
disk.

시스템 설정

Maven

Jenkins
연 동


Maven

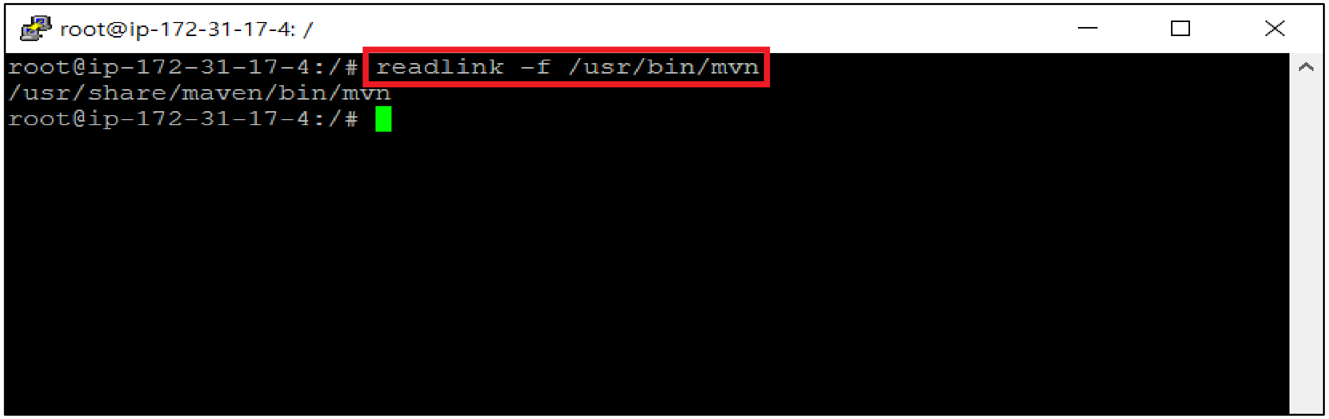
Name: Maven

MAVEN_HOME: /usr/share/maven

☐ Install automatically

Delete Maven
Add Maven

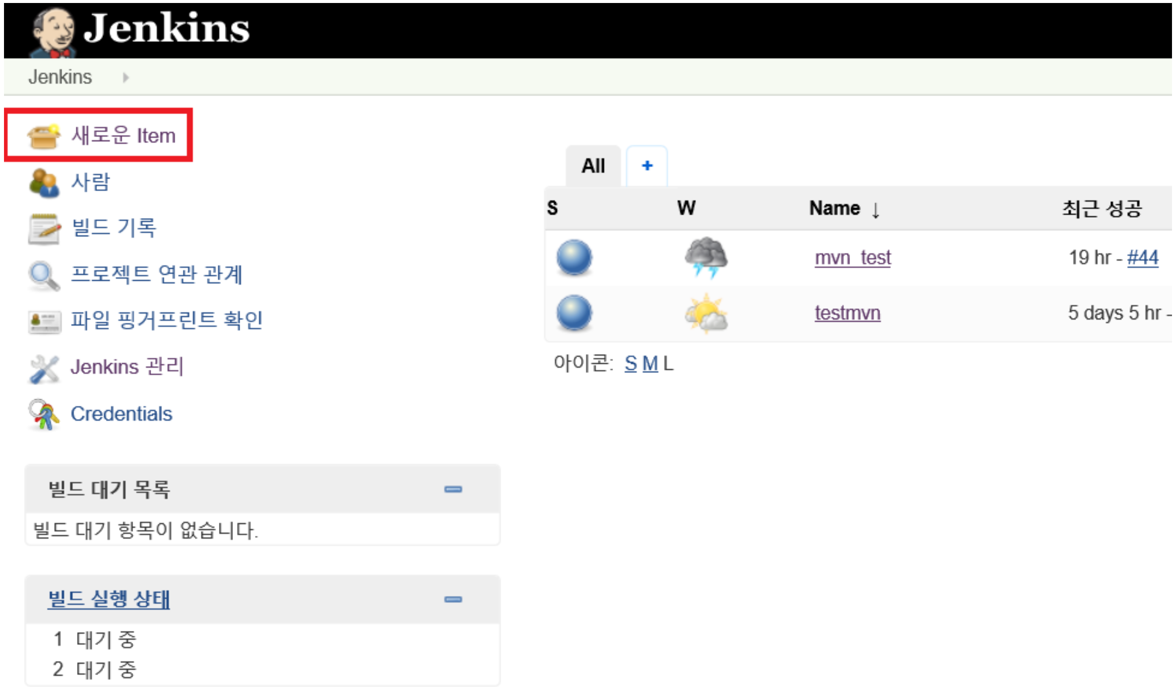
Jenkins Maven 설정


root@ip-172-31-17-4: /

```
root@ip-172-31-17-4:/# readlink -f /usr/bin/mvn
/usr/share/maven/bin/mvn
root@ip-172-31-17-4:/#
```

Linux Maven 설정

Maven



Jenkins

Jenkins

- 새로운 Item
- 사람
- 빌드 기록
- 프로젝트 연관 관계
- 파일 핑거프린트 확인
- Jenkins 관리
- Credentials

빌드 대기 목록

빌드 대기 항목이 없습니다.

빌드 실행 상태

1 대기 중
2 대기 중

All +

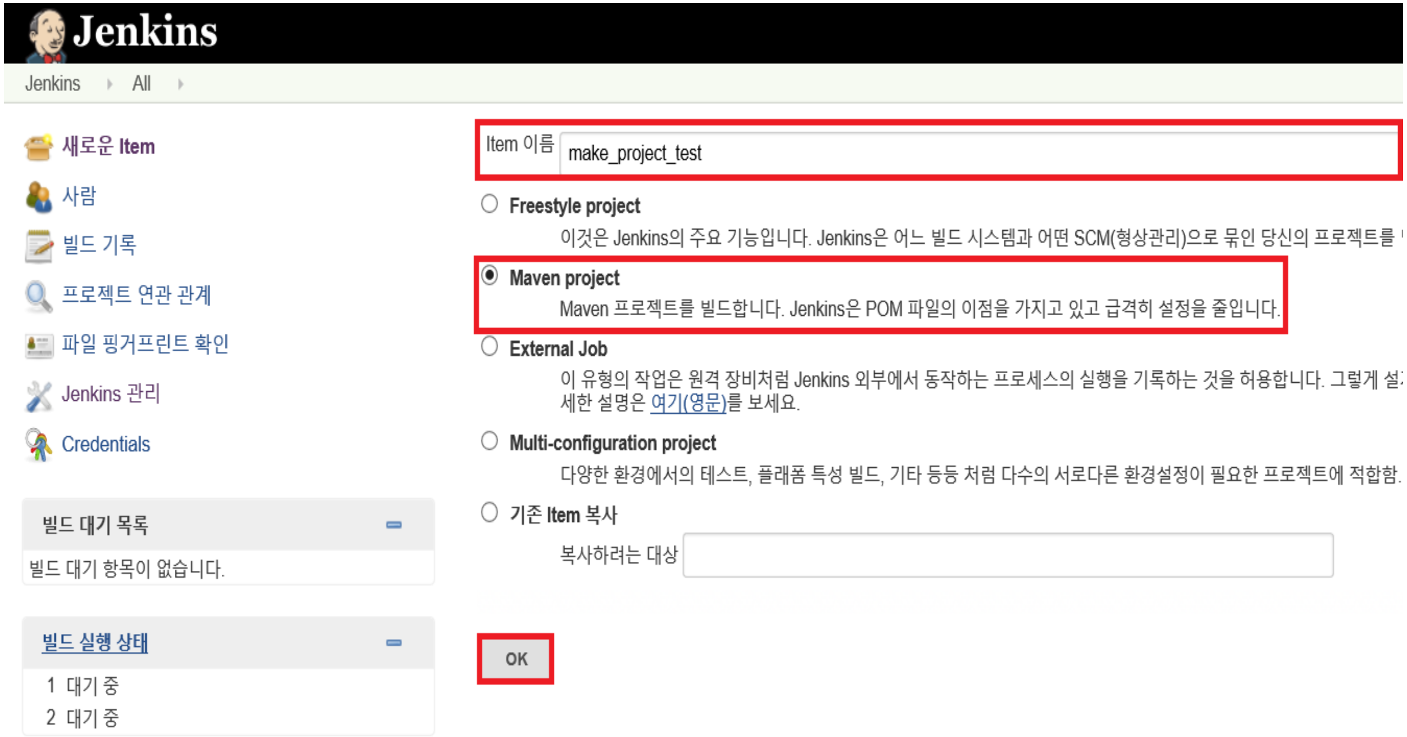
S	W	Name ↓	최근 성공
●		mvn_test	19 hr - #44
●		testmvn	5 days 5 hr -

아이콘: S M L

프로젝트 생성

Maven

프로젝트 생성


Jenkins
Jenkins ▸ All ▸
새로운 Item
사람
빌드 기록
프로젝트 연관 관계
파일 핑거프린트 확인
Jenkins 관리
Credentials
빌드 대기 목록
빌드 실행 상태
OK

빌드 대기 항목이 없습니다.

1 대기 중
2 대기 중

Item 이름: make_project_test

○ **Freestyle project**
이것은 Jenkins의 주요 기능입니다. Jenkins은 어느 빌드 시스템과 어떤 SCM(형상관리)으로 묶인 당신의 프로젝트를

● **Maven project**
Maven 프로젝트를 빌드합니다. Jenkins은 POM 파일의 이점을 가지고 있고 급격히 설정을 줄입니다.

○ **External Job**
이 유형의 작업은 원격 장비처럼 Jenkins 외부에서 동작하는 프로세스의 실행을 기록하는 것을 허용합니다. 그렇게 설
세한 설명은 여기(영문)를 보세요.

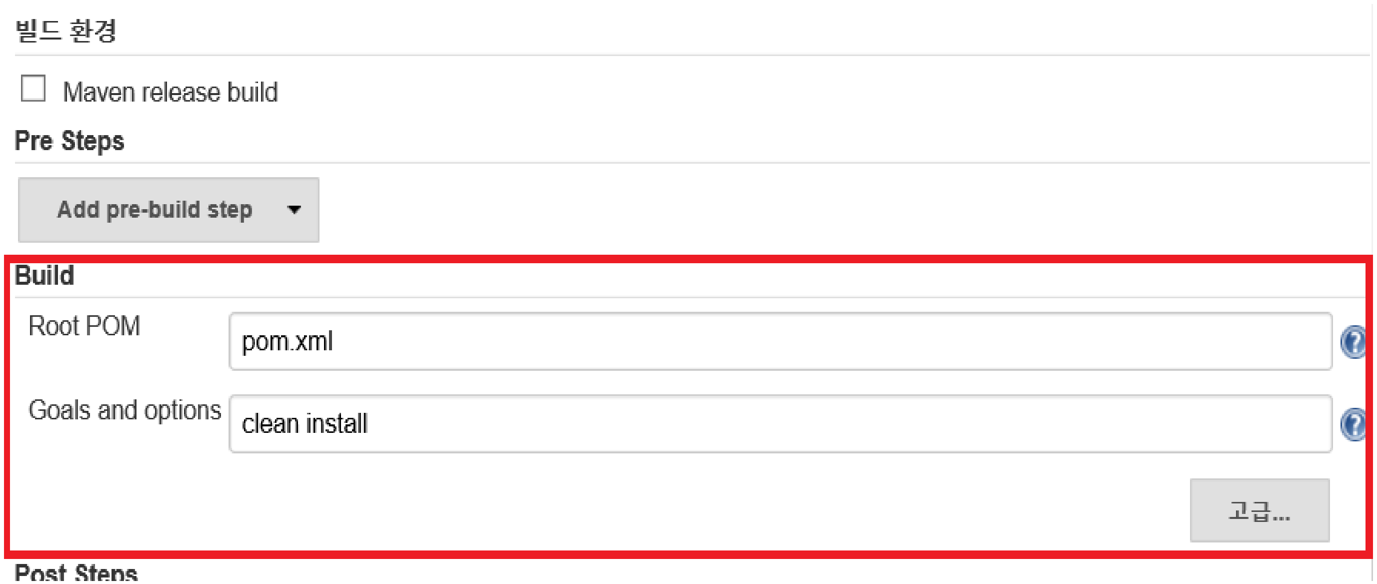
○ **Multi-configuration project**
다양한 환경에서의 테스트, 플래폼 특성 빌드, 기타 등등 처럼 다수의 서로다른 환경설정이 필요한 프로젝트에 적합함.

○ **기존 Item 복사**
복사하려는 대상

Maven Project 선택

Maven

프로젝트 생성



빌드 환경

☐ Maven release build

Pre Steps

Add pre-build step ▾

Build

Root POM: pom.xml

Goals and options: clean install

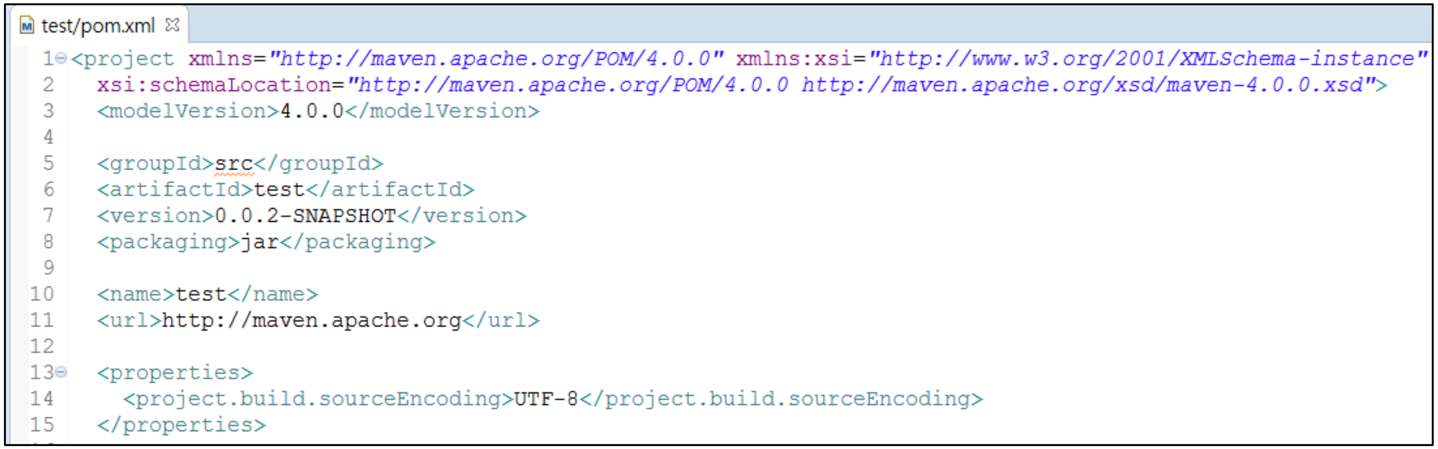
고급...
Post Steps

pom.xml 경로 지정

Goal 설정

Maven

pom.xml 설 명



```
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>

  <groupId>src</groupId>
  <artifactId>test</artifactId>
  <version>0.0.2-SNAPSHOT</version>
  <packaging>jar</packaging>

  <name>test</name>
  <url>http://maven.apache.org</url>

  <properties>
    <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
  </properties>
```

groupId : 프로젝트를 생성하는 조직의 고유 아이디

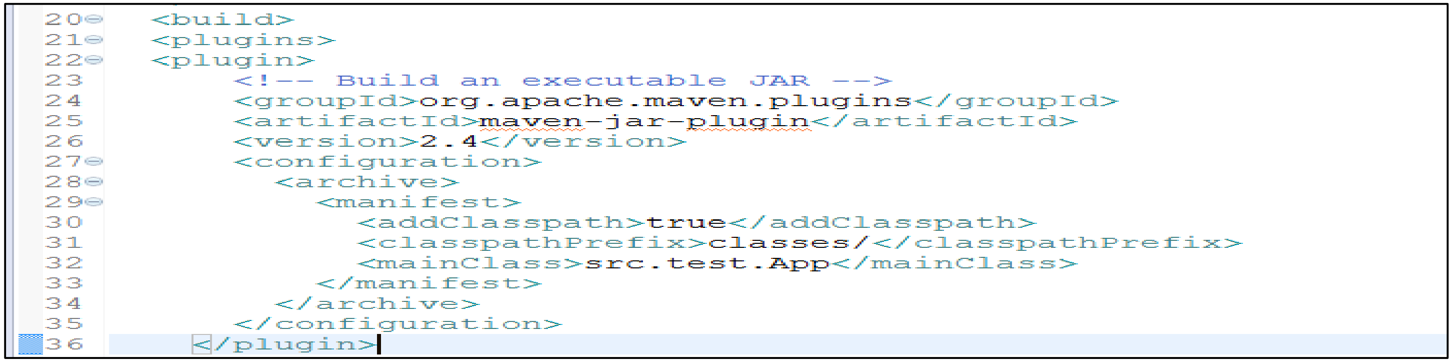
artifactId : 프로젝트에 의하여 생성되는 artifact의 고유 아이디

packaging : 프로젝트를 어떤 형태로 packaging 할 것인지 결정 (jar, war, ear 등)

version : 프로젝트의 현재 버전, 개발 중 일시 SNAPSHOT을 접미사로 사용

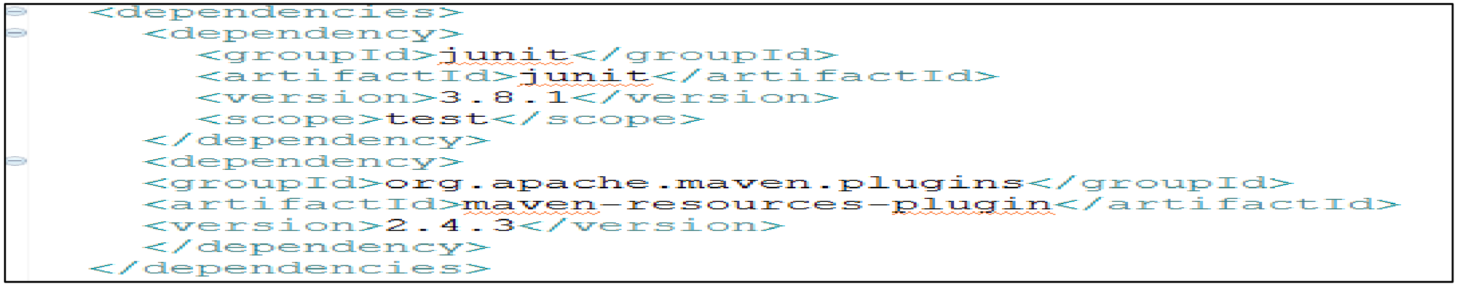
Maven

pom.xml
설 명



```
<build>
<plugins>
<plugin>
    <!-- Build an executable JAR -->
    <groupId>org.apache.maven.plugins</groupId>
    <artifactId>maven-jar-plugin</artifactId>
    <version>2.4</version>
    <configuration>
      <archive>
        <manifest>
          <addClasspath>true</addClasspath>
          <classpathPrefix>classes/</classpathPrefix>
          <mainClass>src.test.App</mainClass>
        </manifest>
      </archive>
    </configuration>
  </plugin>
```

plugin : 빌드 시 필요한 플러그인 지정

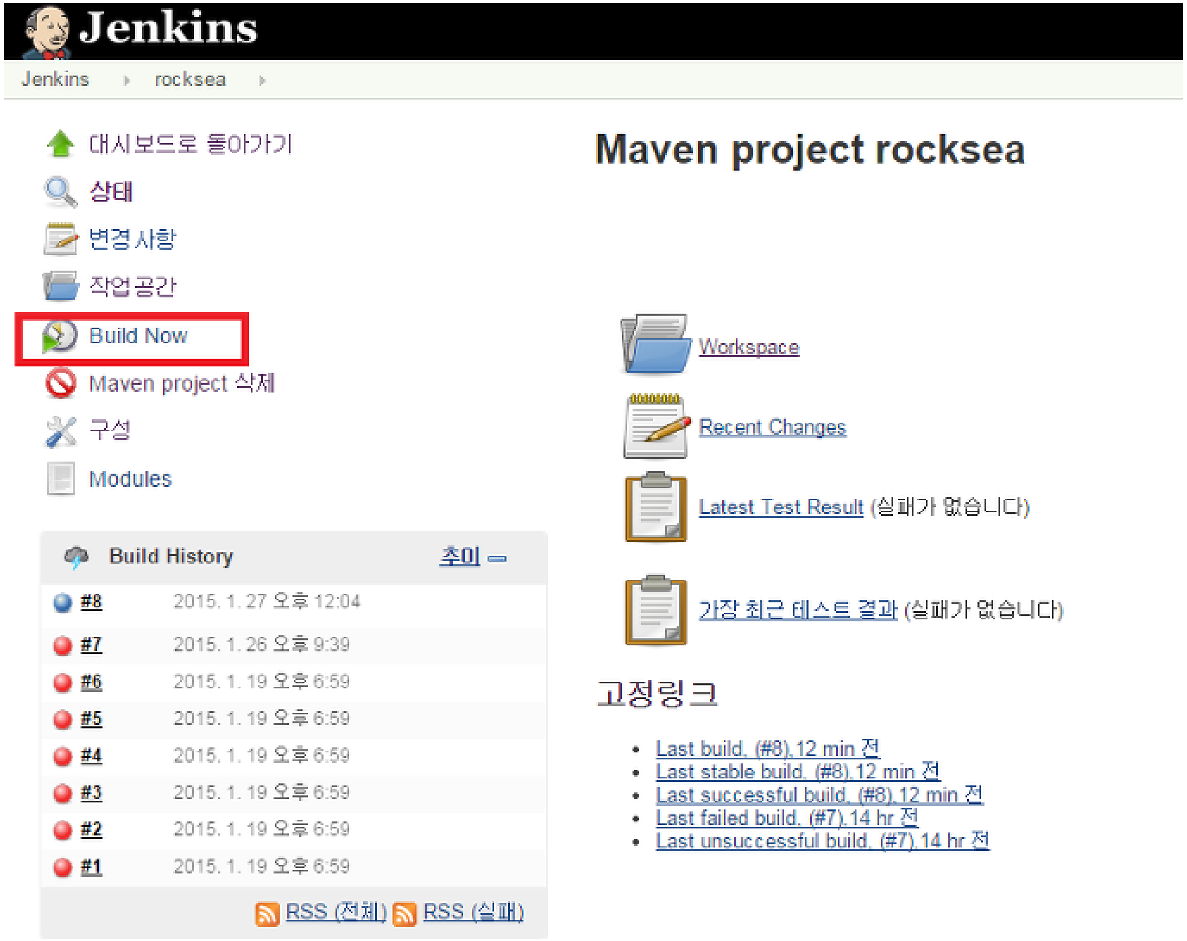


```
<dependencies>
  <dependency>
    <groupId>junit</groupId>
    <artifactId>junit</artifactId>
    <version>3.8.1</version>
    <scope>test</scope>
  </dependency>
  <dependency>
  <groupId>org.apache.maven.plugins</groupId>
  <artifactId>maven-resources-plugin</artifactId>
  <version>2.4.3</version>
  </dependency>
</dependencies>
```

dependency
: 프로젝트와 의존관계가 있는 프로젝트의 패키지 지정

Maven

프로젝트 빌드



Jenkins

Jenkins › rocksea ›

- 대시보드로 돌아가기
- 상태
- 변경 사항
- 작업공간
- Build Now
- Maven project 삭제
- 구성
- Modules

Build History 추이 —

🔵	#8	2015. 1. 27 오후 12:04
🔴	#7	2015. 1. 26 오후 9:39
🔴	#6	2015. 1. 19 오후 6:59
🔴	#5	2015. 1. 19 오후 6:59
🔴	#4	2015. 1. 19 오후 6:59
🔴	#3	2015. 1. 19 오후 6:59
🔴	#2	2015. 1. 19 오후 6:59
🔴	#1	2015. 1. 19 오후 6:59

RSS (전체) RSS (실패)

Maven project rocksea

Workspace

Recent Changes

Latest Test Result (실패가 없습니다)

가장 최근 테스트 결과 (실패가 없습니다)

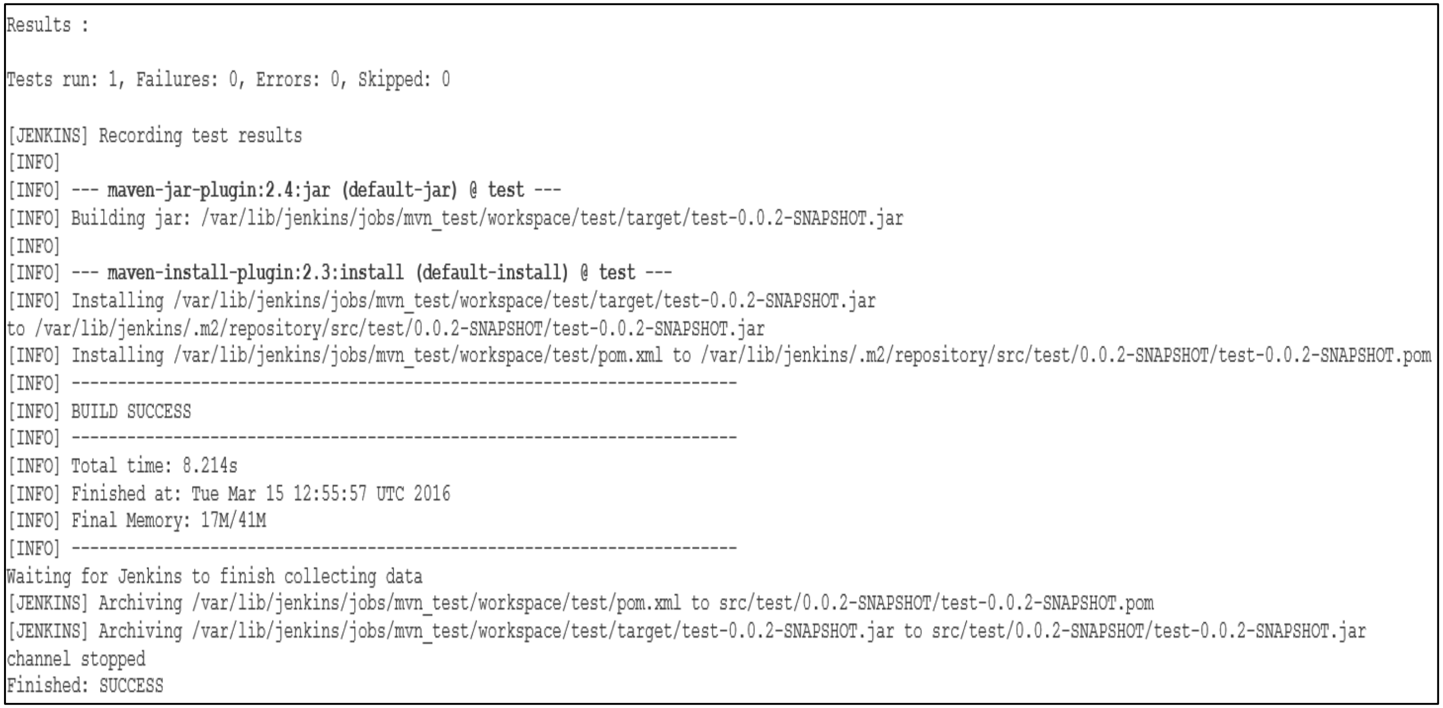
고정링크

- Last build. (#8), 12 min 전
- Last stable build. (#8), 12 min 전
- Last successful build. (#8), 12 min 전
- Last failed build. (#7), 14 hr 전
- Last unsuccessful build. (#7), 14 hr 전

Build Now

Maven

프로젝트
빌드

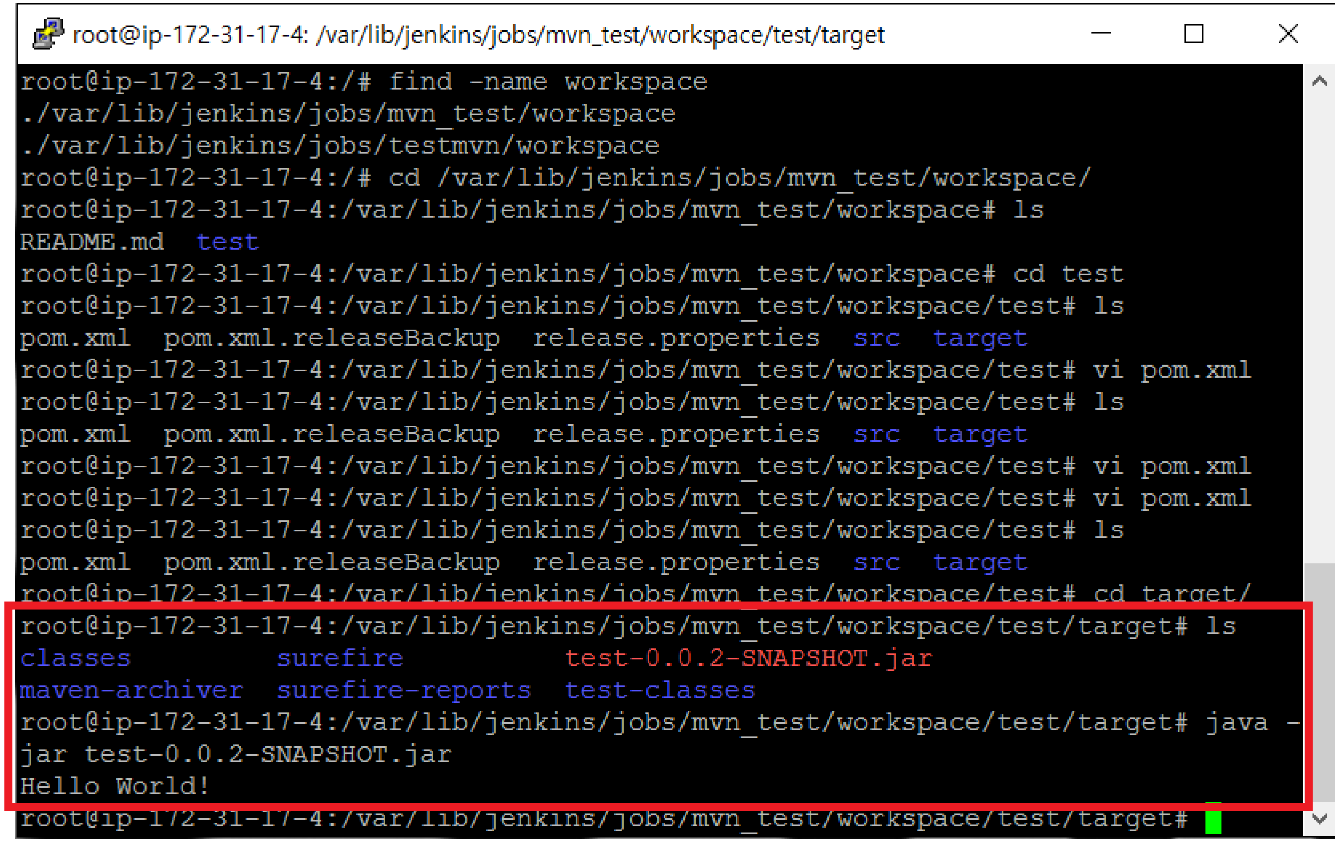


```
Results :

Tests run: 1, Failures: 0, Errors: 0, Skipped: 0

[JENKINS] Recording test results
[INFO]
[INFO] --- maven-jar-plugin:2.4:jar (default-jar) @ test ---
[INFO] Building jar: /var/lib/jenkins/jobs/mvn_test/workspace/test/target/test-0.0.2-SNAPSHOT.jar
[INFO]
[INFO] --- maven-install-plugin:2.3:install (default-install) @ test ---
[INFO] Installing /var/lib/jenkins/jobs/mvn_test/workspace/test/target/test-0.0.2-SNAPSHOT.jar
to /var/lib/jenkins/.m2/repository/src/test/0.0.2-SNAPSHOT/test-0.0.2-SNAPSHOT.jar
[INFO] Installing /var/lib/jenkins/jobs/mvn_test/workspace/test/pom.xml to /var/lib/jenkins/.m2/repository/src/test/0.0.2-SNAPSHOT/test-0.0.2-SNAPSHOT.pom
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time: 8.214s
[INFO] Finished at: Tue Mar 15 12:55:57 UTC 2016
[INFO] Final Memory: 17M/41M
[INFO] ------------------------------------------------------------------------
Waiting for Jenkins to finish collecting data
[JENKINS] Archiving /var/lib/jenkins/jobs/mvn_test/workspace/test/pom.xml to src/test/0.0.2-SNAPSHOT/test-0.0.2-SNAPSHOT.pom
[JENKINS] Archiving /var/lib/jenkins/jobs/mvn_test/workspace/test/target/test-0.0.2-SNAPSHOT.jar to src/test/0.0.2-SNAPSHOT/test-0.0.2-SNAPSHOT.jar
channel stopped
Finished: SUCCESS
```

Console Output Log 확인

Maven

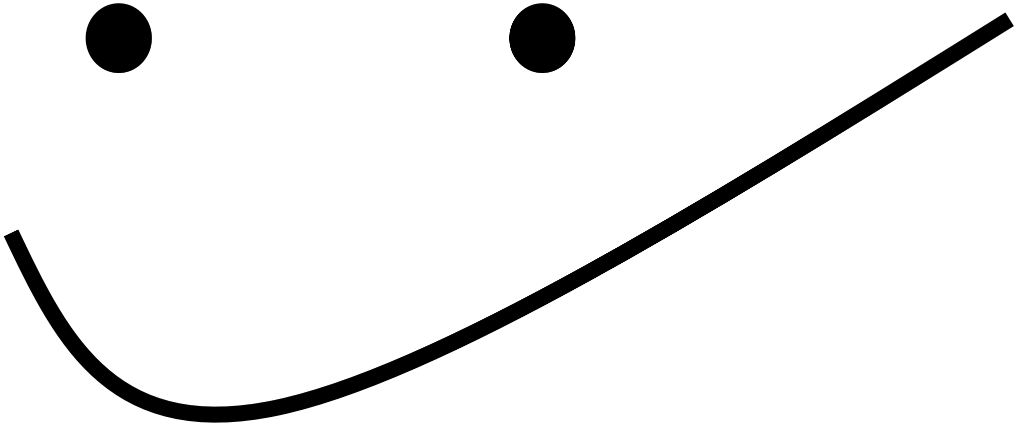
프로젝트 빌드



root@ip-172-31-17-4: /var/lib/jenkins/jobs/mvn_test/workspace/test/target

```
root@ip-172-31-17-4:/# find -name workspace
./var/lib/jenkins/jobs/mvn_test/workspace
./var/lib/jenkins/jobs/testmvn/workspace
root@ip-172-31-17-4:/# cd /var/lib/jenkins/jobs/mvn_test/workspace/
root@ip-172-31-17-4:/var/lib/jenkins/jobs/mvn_test/workspace# ls
README.md  test
root@ip-172-31-17-4:/var/lib/jenkins/jobs/mvn_test/workspace# cd test
root@ip-172-31-17-4:/var/lib/jenkins/jobs/mvn_test/workspace/test# ls
pom.xml  pom.xml.releaseBackup  release.properties  src  target
root@ip-172-31-17-4:/var/lib/jenkins/jobs/mvn_test/workspace/test# vi pom.xml
root@ip-172-31-17-4:/var/lib/jenkins/jobs/mvn_test/workspace/test# ls
pom.xml  pom.xml.releaseBackup  release.properties  src  target
root@ip-172-31-17-4:/var/lib/jenkins/jobs/mvn_test/workspace/test# vi pom.xml
root@ip-172-31-17-4:/var/lib/jenkins/jobs/mvn_test/workspace/test# vi pom.xml
root@ip-172-31-17-4:/var/lib/jenkins/jobs/mvn_test/workspace/test# ls
pom.xml  pom.xml.releaseBackup  release.properties  src  target
root@ip-172-31-17-4:/var/lib/jenkins/jobs/mvn_test/workspace/test# cd target/
root@ip-172-31-17-4:/var/lib/jenkins/jobs/mvn_test/workspace/test/target# ls
classes          surefire          test-0.0.2-SNAPSHOT.jar
maven-archiver   surefire-reports  test-classes
root@ip-172-31-17-4:/var/lib/jenkins/jobs/mvn_test/workspace/test/target# java -
jar test-0.0.2-SNAPSHOT.jar
Hello World!
root@ip-172-31-17-4:/var/lib/jenkins/jobs/mvn_test/workspace/test/target#
```

Build 결과 확인 & 실행



Thank You

for Your Attention